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DISEASES CAUSED BY BACTERIA AND FUNGI

THÖRNE, H. (1958). Bovin mastit med fynd av stafylococcer i sekretet. Em klinisk-bakteriologisk studie. **[Bovine staphylococcal mastitis. A clinical and bacteriological study.]** — *Thesis, Stockholm* pp. 23. [In Swedish.] **3078**

A summary in Swedish of the author's work, which has been published as a series of 6 articles in *Nordisk Veterinaermedicin*.—R.M.

WALLMARK, G. & THÖRNE, H. (1958). **Bacteriophage-types and sensitivity to penicillin of staphylococci isolated from bovine mastitis.**—*Nord. VetMed.* **10,** 76-81. [In English. Summaries in Swedish and German.] **3079**

Among 246 strains of coagulase-positive staphylococci isolated from 165 cows, most of them with clinical chronic mastitis, 207 were more or less strongly lysed by one or more of a set of phages used for typing human strains. A predominance of strains with a certain phage pattern was noted in individual herds, suggesting a common origin of the infection. Five main types of pattern were found. About one third of the strains could be referred to phage group III. It was thought that phages used for typing human strains are in many cases not very suitable for typing animal strains. 13·4% of the strains were penicillin-resistant and all produced penicillinase. The majority of these (24) occurred among 30 strains (6 herds) belonging to phage pattern 6/47/819/1034+(Type 2A).

—G. P. MARSHALL.

BROWN, R. W. & SCHERER, R. K. (1958). **A study of the necrotizing action of staphylococcic *alpha* toxin.**—*Amer. J. vet. Res.* **19,** 354-362. [Authors' summary modified.] **3080**

To understand better the development of gangrene of the udder as a result of infection with *Staph. pyogenes* the authors studied skin necrosis produced in rabbits after i/d inj. of staphylococcal *alpha* toxin. The necrosis was ischaemic and was probably caused by the vasoconstricting action of the toxin. The toxin probably acts directly on the blood vessels to produce vasconstriction, rather than indirectly by stimulation of vasoconstrictor nerve fibres.

The failure to produce paralysis in a 7-month-old calf and a 2-year-old heifer by the epidural injection of toxin was considered evidence that the paralysis seen in some cases of acute staphylococcal mastitis may not be neurogenic but, rather, the result of an ischaemia caused by the vasoconstricting action of the toxin on the blood vessels of the hindlegs.

FORNONI, Q. (1958). Ricerca degli streptococchi *agalactiae, dysgalactiae* ed *uberis* nelle tonsille di bovini e suini. **[Isolation of *Str. agalactiae, Str. dysgalactiae* and *Str. uberis* from the tonsils of cows and sows.]** — *Vet. ital.* **9,** 201-206. [Summaries in English, French and German.] **3081**

Cultural examination of tonsils of 222 slaughter cattle revealed: *Str. agalactiae,* 8; *Str. dysgalactiae,* 10; and *Str. uberis,* 1. Tonsils of 402 slaughter pigs yielded: *Str. agalactiae,* 24; *Str. dysgalactiae,* 8.—T.E.G.R.

KJEMS, E. (1957). **Studies on streptococcal bacteriophages. II. Adsorption, lysogenization, and one-step growth experiments.**—*Acta path. microbiol. scand.* **42,** 56-66. [In English. Author's summary modified.] [For Part I, see *V.B.* **25,** 3232.] **3082**

A streptococcal bacteriophage isolated from sewage—phage (sewage)—and another isolated from a haemolytic streptococcus Group A—phage (strep)—differed serologically and in heat lability and adsorption rate. Furthermore, phage (strep), in contrast to phage (sewage), is able to penetrate the hyaluronic acid capsule, probably owing to the hyaluronidase present in the phage (strep) stock, and phage (sewage) is virulent, whereas phage (strep) is "temperate" (able to give rise to a lysogenic system). The latent period of phage (strep) is about 60 min.; the

average burst size about 32 phage particles per infected bacterium.

JONES, W. F., JR., FELDMAN, H. A. & FINLAND, M. (1957). **Susceptibility of hemolytic streptococci, other than those of group D, to eleven antibiotics** *in vitro*.—*Amer. J. clin. Path.* **27**, 159-169. [Summary in Interlingua.] **3083**

Most of the 394 strains of haemolytic streptococci were uniformly susceptible to each of the antibiotics tested except bacitracin. *In vitro* activity was, in descending order: penicillin, erythromycin, carbomycin, oxytetracycline, chloramphenicol, streptomycin, neomycin, and polymyxin. In the case of bacitracin most of the strains of Group A were uniformly susceptible, and to a higher degree than those of other groups which varied widely in their susceptibility. Slight differences were also observed among groups in their susceptibility to erythromycin and penicillin. Results obtained with some of the antibiotics are compared with those of previous tests.

—T.E.G.R.

POUNDEN, W. D., PRATT, A. D., FRANK, N. A. & SMITH, H. R. (1958). **The incidence of mastitis in cows fed legume-grass mixtures as fresh cut crop and as silage.**—*J. Amer. vet. med. Ass.* **132**, 337-339. **3084**

From May to September, 15 cows were fed a mixture of freshly cut lucerne, clover and grass; 6 had 27 attacks of mastitis in 14 quarters. On the other hand, of 15 cows fed on silage made the previous year from similar crops in the same fields 3 had 10 attacks in 3 quarters. Of 5 cows fed fresh forage and silage alternately 3 had 17 attacks in 6 quarters. Culture of 39 samples of mastitis milk yielded 9 slightly α-haemolytic and 8 non-haemolytic micrococci, 7 non-haemolytic short-chain streptococci, 6 Gram-negative rods resembling coliform organisms, 1 *Pseudomonas*, 1 fungus, and 1 mixed flora. Four of the streptococci, 1 *Micrococcus* and 1 coliform failed to grow on tryptose blood agar, but were recovered by culture in thiol medium.—M.G.G.

JOSEPH, M. C. (1958). **Experimental investigation of the relationship between method of treatment and subsequent immunity.** — *Brit. med. J.* June 21st, pp. 1444-1448. [Author's summary modified.] **3085**

As a result of the good response observed in children with acute respiratory infection when treated with a large single dose of penicillin and sulphadimidine, an experimental investigation into the relationship between method of treatment and subsequent immunity was planned.

Mice were infected with virulent pneumococci and then treated with a mixture of sodium sulphadimidine and penicillin. There were two different treatment groups: (1) a single massive dose of sulphadimidine and penicillin, and (2) six smaller doses repeated at intervals of 8 hours. Treatment of both groups started 10 hours after infection. Ten days later the survivors in each group were re-infected with challenging doses of pneumococci, and the immunity of each treatment group was evaluated by mortality.

In each experiment except one the single-dose group showed either a lower or a similar mortality on re-infection compared with the group having repeated doses. When all the results were taken together, a significant difference at the 1% level in favour of single-dose therapy was observed.

ROTH, N. G., LIVELY, D. H. & METCALFE, S. N., JR. (1958). **Correlation of environmental and biological changes occurring in a complex medium during growth and sporulation of *Bacillus* species.** — *J. Bact.* **75**, 436-442. [Authors' summary modified.] **3086**

A series of concomitant measurements of biological, physical, and chemical changes occurring during growth and sporulation of *Bacillus anthracis* and *B. subtilis* var. *niger* under conditions which favour essentially complete sporulation and a high final spore count are reported. With chain-forming *B. anthracis*, viscosity and volume of sediment increase as chain length increases and then decrease as chains break up; with non chain-forming *B. subtilis* var. *niger*, these values increase directly with growth and do not decrease measurably after growth is complete. In both cases turbidity increases with growth and reaches a peak shortly after sporulation begins; a drop in turbidity is associated with autolysis of vegetative material. The pH of the growth medium of both organisms decreases slightly from neutrality shortly after germination occurs, rises slightly during the vegetative stage, increases sharply to a pH greater than 8·0 during sporulation, and levels off after sporulation. Combined total solids of medium plus cells decrease sharply during vegetative growth and level off after sporulation has begun. No measurable changes in specific gravity of cultures occurs. Rapid utilization of carbohydrate and nitrogen occurs during the vegetative phase and is essentially complete 2 to 4 hours before sporulation is apparent. Increase in extracellular nitrogen occurs during autolysis.

NILÉHN, P.-O. (1958). Infektioner med antraxliknande mikrober. [**Infection with anthracoid**

bacilli.]—*Nord. VetMed.* **10,** 325-330. [In Swedish. Summaries in English and German. English summary modified.] **3087**

N. described septicaemia caused by anthrax-like bacilli in a cat with enteritis and a cow with mastitis. These bacilli could be clearly differentiated from *B. anthracis* and were considered to be *B. cereus*. The pathogenicity of *B. cereus* was discussed.

MEYN, A., SCHLIESSER, T. & SCHNEIDER-PUNGS, K. (1957). Untersuchungen über das Vorkommen von Tuberkelbakterien in der Gebärmutter tuberkulöser Rinder. [**Occurrence of tubercle bacilli in the uterus of tuberculous cows.**] — *Rindertuberk. u. Brucellose* **6,** 193-198. **3088**

Bovine tubercle bacilli were recovered, by g.pig inoculation, from 33 of the apparently normal uteri of 95 tuberculous cattle, the carcasses of which had been passed as fit for human consumption. Miliary foci were found in the mucous membrane of 18 of the uteri. It is considered that the uterus is a predilection site for blood-borne secondary tuberculosis foci.

—M.G.G.

LEISTNER, W. (1958). Das Vorkommen von Tuberkulosebakterien in pasteurisierter Flaschenmilch aus Molkereien des Bezirkes Leipzig. [**Occurrence of tubercle bacilli in pasteurized bottled milk from dairies in the Leipzig district.**] — *Mh. VetMed.* **13,** 117-120. **3089**

Tubercle bacilli were found, through P.M. examination of inoculated g.pigs, in 3 samples of pasteurized milk from 2 dairies. Milk from 11 other dairies in the district was negative. It is considered that the temp. of the milk during pasteurization is not sufficiently controlled in most dairies.—M.G.G.

AVELLINI, G. (1957). Attività antitubercolare nel vitello dell'associazione streptomicina-diidrostreptomicina - metansulfonato sodico dell'idrazide dell'acido isonicotinico. [**Treatment of tuberculosis in calves with a combination of streptomycin, dihydrostreptomycin and a sulphone compound of isoniazid.**] — *Vet. ital.* **8,** 769-778. [Summaries in English, French and German.] **3090**

Observations on four experimentally infected calves led to the conclusion that the therapeutic action of a combination of streptomycin, dihydrostreptomycin and sodium methane sulphonate of isoniazid was superior to that of isoniazid alone in the treatment of TB.—T.E.G.R.

NARASINGA RAI, B. & CHANDRASEKHARAN, K. P. (1958). **A case of tuberculosis in a giraffe.** (*Giraffa camelopardalis*).—*Indian vet. J.* **35,** 221-224. **3091**

The authors describe the P.M. findings in a 12-year-old giraffe which died from infection with human-type TB. They claim not only that this is the first record of TB. in a giraffe, but that the finding of human-type tubercle bacilli is strange. [The authors are incorrect in making this claim since cases have been described in giraffes from 1892 onwards; *e.g.* Myers, J. C. (1892). *J. comp. Med.* **14,** 101; Martinaglia, G. (1937). *S. Afr. J. Sci.* **33,** 833-844.]

—R. N. FIENNES.

ALLEN, A. M. & KINARD, R. F. (1958). **Primary cutaneous inoculation tuberculosis in the *Macaca mulatta* monkey.** — *Amer. J. Path.* **34,** 337-347. [Authors' summary modified.] **3092**

Six young *M. mulatta* monkeys were accidentally inoculated i/d with tuberculous exudate which contaminated the needles of a tattooing machine. Clinical and histological observations indicated that the resulting lesions were of the primary cutaneous complex of TB. The chronological development of the lesions was similar to that of the primary cutaneous complex in man.

SIMINTZIS, C. (1957). Epizootie de tuberculose chez le vison (*Mustela lutreola*). [**Epidemic of TB. in mink.**]—*Bull. Acad. vét. Fr.* **30,** 378-385. **3093**

An account is given of an outbreak of TB. on a mink farm where nine of 57 animals died. The causal organism was of the bovine type and was partially resistant to isoniazid and to *p*-aminosalicylic acid.—T.E.G.R.

ANON. (1958). **Precautions against tuberculosis infection in the diagnostic laboratory.**—*Mon. Bull. Minist. Hlth Lab. Serv.* **17,** 10-18. **3094**

Tuberculous material should not be examined in a small cubicle partitioned off from the laboratory. For a single individual a laboratory with a total volume of 1,000 cubic feet and 6 changes of air per hour is necessary. If a separate room cannot be provided, a bench in a large laboratory may be used. A protective cabinet is necessary. The surface of the bench should be smooth and impervious. Containers and tubes should be stood in trays or racks which can be sterilized. Films of sputum must not be prepared by squeezing between two glass slides. Angle centrifuges and screw-capped bottles in a

horizontal centrifuge are dangerous. Methods which obviate the use of a centrifuge should be considered. Supernatant should be poured away through a funnel. Loops should be preliminarily sterilized before being held in a flame, or disposable applicators should be used. All infected material and containers should be sterilized by heat before being washed or discarded. The dangers of opening screw-capped bottles can be avoided by the use of a plastic seal or a protective hood. Animal houses must be hygienic and well ventilated. Animals with open lesions should be killed immediately. It is advisable to incise macroscopic lesions in a protective hood. New staff should be X-rayed and tuberculin-tested and, if negative, offered B.C.G. They must be instructed on the sources and avoidance of infection.—M.G.G.

KENNEDY, H. E., VANDIVIERE, H. M. & WILLIS, H. S. (1958). **The effects of extended incubation on propagability of tubercle bacilli.** — *Amer. Rev. Tuberc.* **77,** 802-814. [Summaries in French and Spanish.] **3095**

No visible growth of tubercle bacilli was observed in 6,076 of 8,165 eight-week-old cultures of material from human beings suspected of being tuberculous. When cultivation was prolonged for up to 8 months, growth was obtained in 91 of the previously negative cultures.—R.M.

GASTAMBIDE-ODIER, M. & SMITH, D. W. (1958). **A rapid means of differentiating atypical acid-fast bacilli and avian tubercle bacilli from other mycobacteria. The neotetrazolium inhibition test.**—*Amer. Rev. Tuberc.* **77,** 662-668. [Summaries in French and Spanish. Authors' summary modified.] **3096**

20 strains of mycobacteria thought to be atypical and 15 other known strains of mycobacteria, including human, bovine, and avian varieties, were tested for inhibition by neotetrazolium. Both virulent and attenuated strains were included. The strains were divided into two groups: (1) human, bovine, saprophytic, and *M. fortuitum* strains which did not grow in a concentration of neotetrazolium higher than 1:40,000; and (2) atypical and avian strains which grew in concentrations higher than 1:40,000. The differentiation of atypical or avian strains from human strains is particularly easy by this simple and rapid test.

I. HOLZ, W. (1958). Die Beeinflussung der Säureresistenz von Tuberkelbakterien durch Desinfektionsmittel. **[Influence of disinfectants on the acid-resistance of tubercle bacilli.]** —*Zbl. VetMed.* **5,** 83-90. **3097**

II. HOLZ, W. (1958). Zum Problem der Desinfektionsmittelnachwirkung bei Desinfektionsversuchen auf Tuberkelbakterien. **[The problem of delayed action of disinfectants in disinfection studies with tubercle bacilli.]**—*Ibid.* 91-100. [Summaries in English, French and Spanish. English summaries modified.] **3098**

I. Certain organic substances, especially ethereal oils, can greatly reduce the acid-fastness of tubercle bacilli. After being treated with these substances, strains of the human type of tubercle bacillus which had recently been isolated and possessed normal acid-fastness, were killed by subsequent treatment with acids, whereas the oils used alone had only a slight bactericidal effect. These results were demonstrable both by cultural and animal inoculation techniques. Animal inoculation experiments showed that virulence and resistance to acid were not interdependent, so that loss of acid-fastness was possible without any effect on virulence. Formaldehyde had no effect on the acid-fastness of the strains studied.

Since the acid-fastness of tubercle bacilli is affected to varying degrees and, often considerably, by disinfectants, it is important when testing their bactericidal action to avoid treatment with acids.

II. This article deals with an experimental study to determine whether results of animal experiments in the testing of disinfectants for tubercle bacilli are affected by the thorough removal of the disinfectant from the test organisms before their inoculation.

Tubercle bacilli were exposed to formaldehyde for varying times and then inoculated into g.pigs, the disinfectant residue being first removed by different methods and to varying extents. A large dose of bacilli injected with traces of formaldehyde resulted in reduced spread of the infection, where a small dose of organisms rendered completely free from formaldehyde produced unhindered generalization. The inhibitory effect of the disinfectant injected with the bacilli was considered to be exerted locally at the inoculation site.

The results show the need for getting rid of all traces of disinfectant when testing for bactericidal action, even when animal inoculation methods are used. A 1:60 dilution and simultaneous homogenization of the material in a mixer was a very satisfactory procedure for avoiding delayed effects of disinfectants in such tests.

WAGNER, J. C., BUCHANAN, G., BOKKENHEUSER, V. & LEVISEUR, S. (1958). **An acid-fast**

bacillus isolated from the lungs of the Cape hyrax, *Procavia capensis* (Pallas).—*Nature, Lond.* **181,** 284-285. **3099**

Examination of 86 Cape hyrax (locally known as dassie) revealed granulomatous lesions in the lungs of 4. Lesion material inoculated intraperitoneally into 4 dassies yielded in one a caseous inguinal lymph node containing numerous acid-fast bacteria, which after 4 months yielded a pure culture on Dorset's egg medium. Morphologically, the organism is a typical acid-fast rod, often showing granules, and capable of being differentiated microscopically in culture from the vole bacillus. Of mycobacterial media, Dorset's egg yields the best growth, which is not increased by addition of 5% glycerol. Growth is better at 37°C. than at 26°C., usually appears at 3–4 weeks on primary isolation and at one week on subculture. Two types of colonies appear on solid media, particularly on prolonged incubation, one being small, round, regular and matt, the other larger, flat, irregular, and with a raised centre. The organism is sensitive to streptomycin, isoniazid, and *p*-aminosalicylic acid.

Biologically, the lesions produced in dassies, rabbits, g.pigs, white rats, white mice, and several varieties of veld rodents were similar to those produced by the vole bacillus. The vole bacillus produced a rapidly fatal pneumonia in white mice, the "dassie" bacillus an early generalized miliary infection which regressed. The "dassie" bacillus shares morphological, cultural, and biological characteristics with the vole bacillus, but it is not certain whether it should be regarded as a new species or a non-virulent variant of the vole bacillus.

—A. B. PATERSON.

VOGEL, H. (1958). **Mycobacteria from cold-blooded animals.**—*Amer. Rev. Tuberc.* **77,** 823-38. [Summaries in French and Spanish.] **3100**

A review of the literature.—R.M.

VANDRA, E. & GÁL, F. (1958). **Isolation of phages active against mycobacteria.**—*Acta microbiol. Acad. Sci. Hung.* **5,** 43-48. [In English. Authors' summary.] **3101**

From 28 samples of soil, phage was isolated by two different methods in 5 cases. In 2 cases phage was active against *Mycobacterium phlei* and in the other 3 cases against *Mycobacterium minetti, smegmatis* and *friburgensis,* respectively.

QUEVEDO, J. M., RODRIGUEZ LOUSTAU, J. A., RIZZO, H. R., METTLER, E. A. J., JUAREZ, F., DORSI, J. & PATELLA, R. F. (1957). Algunas observaciones sobre la vacunación contra la adenitis caseosa de los ovinos. Resultados logrados en frigorificos sobre animales vacunados. **[Vaccination of sheep against caseous lymphadenitis.]** — *Rev. Invest. Ganad.* No. 1. pp. 47-58. [Conclusions in English.] **3102**

Thirteen lymph nodes were removed, at slaughter, from each of 6,522 sheep vaccinated as lambs against *Corynebacterium ovis* infection and from each of 5,680 unvaccinated sheep. 1% of the lymph nodes from vaccinated sheep had lesions of *C. ovis* infection, compared with 2·6% of the lymph nodes from unvaccinated sheep. In both groups the incidence of infection increased with age.—M.G.G.

ROWSELL, H. C. (1958). **The effect of stomach contents and the soil on the viability of *Erysipelothrix rhusiopathiae*.** — *J. Amer. vet. med. Ass.* **132,** 357-361. **3103**

The stomach contents of normal pigs at pH 4·3 and above did not destroy viable *E. rhusiopathiae* for at least 3 hours. When the organism was inoculated into soil in large quantities it persisted for a maximum of 21 days.—M.G.G.

FUSSGÄNGER, R. (1958). Zur Frage der Penicillinresistenz der Rotlaufbakterien. **[Penicillin resistance of *E. rhusiopathiae*.]** — *Vet.-med. Nachr.* No. 1. pp. 23-27. **3104**

F. cultured three strains for up to 10 months in broth containing from 1 : 1 million to 1 : 1,000 million parts of benzylpenicillin. No increase in resistance to penicillin could be detected at the end of this period.—R.M.

YOUNG, S. & FIREHAMMER, B. D. (1958). **Abortion attributed to *Listeria monocytogenes* infection in a range herd of beef cattle.**—*J. Amer. vet. med. Ass.* **132,** 434-438. [Authors' summary modified.] **3105**

After the commencement of silage feeding in a range herd of 250 beef cows, 21 cows aborted and 6 died. *Erysipelothrix* (*Listeria*) *monocytogenes* was recovered from the stomach contents of an aborted foetus, the only one which was examined bacteriologically. Of the sera from 16 cows that aborted 9 had agglutinating titres for *E. monocytogenes* higher than 1 : 400. Haematological examination revealed a relative monocytosis in 5 animals.

GRAY, M. L. (1958). **Experimental listeriosis in pregnant animals.**—*Zbl. VetMed.* Suppl. No. 1. pp. 110-116. [In English. Summary in German.] **3106**

When cultures of *Erysipelothrix* (*Listeria*) *monocytogenes* were added to the drinking water of pregnant rabbits, sheep, and goats the foetuses became fatally infected, but if these were rapidly expelled there were no symptoms in the dams. Early in gestation, the conceptus was aborted often as a macerated mass, whilst near term, the young were either stillborn or survived only a few days. Conjunctival instillation in pregnant rabbits caused similar results. After vaginal instillation just before parturition, a small number of the young died, others had symptoms suggestive of central nervous system disorders, whilst in others which appeared normal the organism could be isolated from their brains after refrigeration. Post-partum infection of neonates of less than 7 days old was possible through the mother's milk. Terramycin treatment of rabbits exposed late in pregnancy had some value in protecting the unborn young.
—A. ACKROYD.

DONKER-VOET, J. (1958). **Serological studies on some strains of Listeria monocytogenes especially type IV strains.**—*Zbl. VetMed.* Suppl. No. 1. pp. 37-44. [In English. Summary in German.] **3107**

Of 43 strains of *Erysipelothrix* (*Listeria*) *monocytogenes* examined serologically by Paterson's technique modified by the use of a water-bath at 45°C. instead of 50°C. for the O agglutination reactions and the saturation of the O sera, 19 belonged to Type I and 4 to Type III. The remaining 20 strains could be divided into 5 subtypes IVa—IVe with various combinations of O factors III, V, VI, VII, VIII, and IX.
—A. ACKROYD.

STERNE, M. & HUTCHINSON, I. (1958). **The production of bovine haemorrhagic septicaemia vaccine by continuous culture.** — *Brit. vet. J.* **114,** 176-179. [Authors' summary modified.] **3108**

A small continuous culture vessel is being used for the routine production of haemorrhagic septicaemia vaccine (*Pasteurella septica*, Roberts Type 1). Harvests of 30,000 doses are obtained daily at a concentration of 2–5 mg. dry weight of organisms per dose. At full capacity the apparatus could produce more than 100,000 doses daily. Dissociation is negligible.

SIEGMANN, O. (1958). Untersuchungen über die Epizootologie der Nerzpasteurellose. [*Pasteurella septica* **infection in mink.**] — *Berl. Münch. tierärztl. Wschr.* **71,** 5-7. [Summary in English.] **3109**

Past. septica was isolated from 10 out of 633 mink carcasses sent for examination. It was not demonstrated in the organs of 74 freshly killed, normal mink. Two of the isolated strains were used for the experimental infection of 4 mink. One strain caused the death of a mink infected both s/c and i/p and caused clinical symptoms in a mink infected *via* the food. The second strain caused only local lesions in a mink infected both s/c and i/p, and was harmless for a mink infected orally.—M.G.G.

GOYON, M. & CURSAN, P. (1958). Mammite à *Aerobacter aerogenes* chez la vache. [**Bovine mastitis caused by** *Bacterium aerogenes.*] — *Rec. Méd. vét.* **134,** 213-220. [Summary in English.] **3110**

In a herd of 12 dairy cows 7 developed peracute mastitis 2–3 months after calving. *Bacterium aerogenes* was isolated from the milk. The animals recovered after streptomycin had been instilled into the affected quarters.
—M.G.G.

DAVIES, D. A. L., CRUMPTON, M. J., MACPHERSON, I. A. & HUTCHISON, A. M. (1958). **The adsorption of bacterial polysaccharides by erythrocytes.** — *Immunology* **1,** 157-171. [Authors' summary.] **3111**

Bacterial lipopolysaccharides and 'O' somatic antigens usually require treatment with alkali for maximal adsorption on erythrocytes in preparation for indirect haemagglutination. Although heating enhances sensitizing activity, owing partly to increasing dispersion, it is always less effective than alkali treatment. The presence of a protein component or of the chloroform soluble lipid 'A' does not inhibit erythrocyte sensitizing activity and no change in sugar constituents has been detected as a result of treatment. The specific polysaccharide of *Bacterium aerogenes*, which contains no lipid, requires alkali treatment for activity; in this case the effect of alkali is to remove *O*-acetate (4%). The loss of weight on treatment is also 4% and no other differences can be detected by examining the infra-red absorption spectra of treated and untreated samples. For other materials investigated a loss of *O*-acetyl has been detected, except where alkali treatment is not required to elicit maximal activity, *e.g.* the *Pasteurella pestis* lipopolysaccharide which contains about 50% of lipid 'A'. By re-acetylation of alkali treated polysaccharides it has been shown that *O*-acetyl residues inhibit adsorption on to erythrocytes, but in some instances higher fatty acids are also removed to some extent by treatment with alkali.

MÅNSSON, I. (1957). **The intestinal flora in horses with certain skin changes. With special reference to the coliform microbes.**—*Acta path. microbiol. scand.* Suppl. No. 119. pp. 102. [In English.] [Thesis, Stockholm.] **3112**

A review of the literature of investigations into coliform organisms isolated from horses is followed by a detailed account of the author's experimental work. 106 horses of different breeds including both Thoroughbreds and heavy draught animals were divided into two groups —those which were clinically healthy, and those affected with a chronic condition of malaise characterized in part by dermatitis and decreased appetite. Extensive studies were made of the strains of coliform organisms isolated from the faeces of all these animals. No morphological or cultural differences were found between the strains of coliforms isolated from the two groups, but some of the strains found only in the affected horses manifested a decreased biochemical activity and had a tendency to non-specific agglutination in immune sera of rabbits. This non-specific agglutination was considered to differ from that caused by reversion to the rough form. The pH was higher in the faeces of the affected horses, and the strains of the coliforms isolated had a higher pH optimum, from which it was deduced that the pH of the intestine was a major factor in determining the flora of the alimentary tract. Qualitative but not quantitative changes took place in the flora with changes in the composition of the ration.

This experimental evidence that the debilitation of the affected horses might be due to changes in the coliform flora and pH of the alimentary tract was tested by feeding a broth culture of a strain of organisms isolated from a healthy horse or easily digestible carbohydrates to affected horses. Both procedures resulted in a rapid change of the coliform pattern and pH of the faeces with an accompanying clinical improvement.—W. E. PARISH.

ROBERTS, D. S. (1958). **Further observations on *E. coli* disease in lambs.**—*Aust. vet. J.* **34,** 152-156. **3113**

A second outbreak of infection in lambs due to *E. coli* O group 78 is described. In transmission experiments 6-week-old lambs were readily infected while 9 to 10-week-old lambs were resistant.—J. THOMAS.

HAWK, H. W. (1958). **The influx of leukocytes and presence of bactericidal substances in inoculated uteri of estrous and pseudopregnant rabbits.**—*J. Anim. Sci.* **17,** 416-425. **3114**

The results of the author's experiments indicated the presence of a bactericidal substance in the uterus of oestrous rabbits 4 hours after inoculation of *E. coli*. The inoculated uterus of pseudopregnant rabbits apparently contained less of the active factor at 4 hours. The presence of a bactericidal substance may account for the difference in bactericidal activity in oestrus and pseudopregnancy. [See also *V.B.* **27,** 1358.]—R.M.

MCANULTY, E. (1958). *Salmonellae* **in Uganda.** —*Nature, Lond.* **181,** 576-577. **3115**

Salmonella were isolated from the faeces of 33 (2%) of 1,618 zebu cattle sent for slaughter from the Karamoja district. There were 25 types in all, 5 of them new. *S. dublin* did not occur. Three of the new types were named *S. entebbe, S. kikoma* and *S. karamoja*, and it is proposed to name the other two *S. kampala* and *S. moroto*. It is suggested that some of the types originated from reptiles or from game.—M.G.G.

BOOL, P. H. & KAMPELMACHER, E. H. (1958). **Some data on the occurrence of *Salmonella* in animals in Surinam.** — *Leeuwenhoek ned. Tijdschr.* **24,** 76-80. **3116**

The authors listed 18 serotypes isolated from apparently healthy cattle, pigs, dogs, rats, fowls and toads.—R.M.

DI BLASI, S. (1958). Contributo casistico alla terapia della diarrea neonatale dei vitelli. **[Chloramphenicol therapy in calf diarrhoea.]** —*Progr. vet., Torino* **13,** 283-284 & 286. **3117**

Of 50 young calves with diarrhoea 44 responded to treatment with chloramphenicol i/p; the remaining six died.—T.E.G.R.

SALISBURY, R. M. (1958). **Salmonellosis of sheep.**—*N. Z. vet. J.* **6,** 25. **3118**

Salmonellosis of sheep is primarily a disease of adults, especially fat ewes. A sudden change from good to poor feed, or confinement in yards, or transport and driving over long distances causes carrier ewes to scour and to infect others in close contact.—M.G.G.

RUTQVIST, L. & THAL, E. (1958). **Salmonella isolated from animals and animal products in Sweden during 1956-1957.**—*Nord. VetMed.* **10,** 234-244. [In English. Summaries in Swedish and German.] **3119**

From July 1956 to June 1957, 703 strains of *Salmonella*, belonging to 49 serotypes, were isolated from 9,651 samples. 312 strains, of 15 serotypes, were isolated from domestic animals and birds (304 strains) and from feeding stuffs (8 strains) obtained chiefly from farms with sus-

pected salmonellosis. 161 strains, of 32 serotypes, were isolated from imported meat meal (incidence of 30%), and 230 strains, of 18 serotypes, from imported meat (incidence of 41%). The incidence of *Salmonella* infections in domestic stock did not alter significantly, except in poultry, where there was a rise in *S. montevideo* infections. Five types, *S. cubana* (in a chick), *S. muenchen* (in a dog), *S. meleagridis* (in a pig), *S. telelkebir* (in cattle) and *S. reading* (in a pigeon) had not previously been isolated from animals in Sweden. [See also *V.B.* **28,** 1344.]

—M.G.G.

HAUGE, S. & BØVRE, K. (1958). Forekomst av salmonellabakterier i importert vegetabilsk proteinkraftfor og kraftforblandinger. [**Occurrence of salmonella bacteria in imported vegetable protein concentrates and mixed concentrates.**]—*Nord. VetMed.* **10,** 255-262. [In Norwegian. Summaries in English and German. English summary modified.] **3120**

910 samples of imported vegetable protein concentrates (cotton-seed cake meal, groundnut cake, coconut cake, sunflower cake, soya bean cake meal, rape meal, soya bean meal (extracted) and linseed cake) were examined for salmonella. From 42 (4·6%) samples salmonella were isolated. Cotton-seed cake meal from Mexico had the highest incidence of infection (16% of 200 samples examined). The examination of 200 samples of mixed concentrates disclosed salmonella bacteria in 4 (2%) samples.

The following serotypes were isolated: *S. cubana, derby, kentucky, lexington, loenga* (new type), *manila, meleagridis, montevideo, newington, oranienburg, senftenberg, simsbury, soerenga* (new type), *tennessee, typhi-murium, urbana* and *worthington.*

It is concluded that imported vegetable protein concentrates constitute an important source of salmonella infections in domestic animals in Norway. Meat meal and bone meal are not imported and the Norwegian herring meal is practically sterile.

TAYLOR, W. I., SILLIKER, J. H. & ANDREWS, H. P. (1958). **Isolation of Salmonellae from food samples. I. Factors affecting the choice of media for the detection and enumeration of** *Salmonella.* — *Appl. Microbiol.* **6,** 189-193. **3121**

The authors recommended the use of selenite F enrichment broth containing in addition cystine, followed by streaking on brilliant green agar.—R.M.

BARBESIER, J. (1957). Sur une variété de *Salmonella pullorum.* [**A variant strain of** *Salmonella pullorum.*] — *Arch. Inst. Pasteur, Algér.* **35,** 382-390. **3122**

Mortality in day-old chicks was associated with an organism resembling *S. pullorum* but possessing different biochemical properties: it did not produce gas and production of H_2S was delayed; acidification of rhamnose occurred only on the 4th day, and of sorbitol between 4 and 7 days: there was tardy acidification of litmus milk without coagulation. 15 strains of this organism were isolated in 28 months. Antigenically it possessed typical reactions of the gallinarum–pullorum group.—R.M.

ROZNOWSKI, E. P., JR. & FOLTZ, V. D. (1958). **Flocculation tests for pullorum disease.**—*Amer. J. vet. Res.* **19,** 478-482. [Authors' summary modified.] **3123**

The authors described a method of producing an antigen from cholesterol–lecithin extract of *S. pullorum* that could be used to perform flocculation tests on slides or in tubes. The sensitivity and specificity of the antigen could be adjusted to conform to the standard *S. pullorum* tube-agglutination test. Sera heated at 56°C. for 15 min. gave a better distribution of the floccules and consequently more accurate results.

GERRIETS, E. & WERNER, C. (1958). Vergleichende Therapieversuche an Rhodeländerküken mit Aureomycin und Terramycin bei experimenteller aerogener Infektion mit S. pullorum. [**Treatment of experimental airborne** *S. pullorum* **infection of chicks with chlortetracycline and oxytetracycline.**] — *Arch. Geflügelk.* **22,** 105-110. [Summary in English.] **3124**

Chlortetracycline and oxytetracycline were tested in 4 comparative trials lasting 14 days each for their efficacy in low oral doses against experimental airborne *S. pullorum* infection in chicks. At a level of 200 mg./kg. of feed they caused considerable reduction in losses, but these were so variable as to leave the practical value of this dosage open to doubt. The level of 10 mg./kg. of feed, normally used when these antibiotics are given as feed supplements, proved clearly insufficient to prevent the infection.

—G. P. MARSHALL.

BALDELLI, B. & TORLONE, V. (1958). Ricerche sperimentali sull'impiego del furazolidone nella pullorosi. [**Furazolidone prophylaxis against** *Salmonella pullorum* **infection.**] — *Vet. ital.* **9,** 179-195. [Summaries in English, French and German.] **3125**

50 two-day-old chicks were infected *per os*

with *S. pullorum* and kept with 50 healthy chicks. All were treated for 14 days with 0·04% of furazolidone in the feed, beginning 10 days after infection, and a similar group kept untreated as controls. In the treated group there were no deaths due to *S. pullorum* (controls 9·6%), and the incidence of carriers was 1·07% (controls 29·76%). While furazolidone thus proved to have remarkable therapeutic and prophylactic effects against the infection, a follow-up of the eggs coming from these animals showed that, by itself, it fails to have any effects on the appearance of the disease in subsequent generations.—G. P. MARSHALL.

WILSON, J. E. (1958). **Fowl typhoid in Great Britain.**—*Agric. Rev., Lond.* **3**, 23-29. **3126**

The incidence and distribution of *Salmonella gallinarum* infection in Gt. Britain has increased in recent years. In 1956, 576 outbreaks were diagnosed, and in 1957, up to the end of September, almost 400. Outbreaks have occurred on well managed farms, and it is possible that neighbouring, insanitary premises provide reservoirs of infection. Prevention, treatment and control of the disease are discussed.—M.G.G.

CHUBB, L. G., GORDON, R. F. & TUCKER, J. F. (1958). **The effect of high levels of vitamins on the susceptibility of chickens to *Salmonella gallinarum* infection.**—*Brit. vet. J.* **114**, 55-68. **3127**

Administration of high dietary concentrations of either all the required vitamins or solely the fat-soluble or the water-soluble vitamins, starting 4 weeks before or immediately after oral infection with *S. gallinarum*, had no consistent effect on survival time or mortality in 8-week-old Rhode Island Red and Brown Leghorn chickens. In White Leghorn chickens, however, some of the results suggested that high dietary concentrations of vitamins increased susceptibility to *S. gallinarum*, and that this effect may be associated with the fat-soluble vitamins (A, D, E, K).—M.G.G.

BARRERA POZAS, J. (1958). Contribución al conocimiento de las características bioquímicas y serológicas de las cepas españolas de Salmonella pullorum y Salmonella gallinarum. **[Biochemical and serological properties of Spanish strains of *S. pullorum* and *S. gallinarum*.]** — *Rev. Patronato Biol. anim., Madrid* **4**, 5-44. **3128**

The author classified 257 strains of *S. pullorum* and 57 of *S. gallinarum* according to their action on sugars and their antigenic structure. Factor XII_2 was present in 18 strains of *gallinarum*. These 18 strains and 72 strains of *pullorum* possessed a complete antigenic structure. —R.M.

THOMSEN, A. (1957). **The eradication of bovine brucellosis in Scandinavia.** In "Advances in veterinary science" Vol. III. pp. 197-240. [New York (& London): Academic Press Inc.] **3129**

The campaigns which have resulted in the eradication of bovine brucellosis in Norway, Finland and Sweden and in a reduction in the herd incidence from 25% in 1944 to less than 0·5% in 1956 in Denmark are described and details given of the various laboratory tests for diagnosis. The campaigns in all 4 countries have consisted basically of obtaining the voluntary co-operation of agricultural and dairy organizations to encourage farmers to have their cattle blood-tested and, if infected, slaughtered at state expense and their premises disinfected, reinforced by legislative regulations. In Finland to a greater extent than in the other countries, compulsory slaughter of infected animals or whole herds was adopted, whilst in Sweden vaccination with Strain 19 has been practised in severely infected herds. On the basis of these excellent results, a scheme which may be helpful to other countries is propounded for controlling the disease.—A. ACKROYD.

MCDIARMID, A., FINDLAY, H. T., JAMESON, J. E., PHEASE, R. N., WALKER, J. H. C., JONES, L. M. & OGONOWSKI, K. (1958). **Ring and plate milk agglutination tests for brucellosis in cattle—a report from the Agricultural Research Council's Field Station at Compton, the Public Health Laboratory Service and the Ministry of Agriculture's Veterinary Laboratory at Weybridge, on a combined testing programme employing cattle of known history.** — *Brit. vet. J.* **114**, 83-95. **3130**

Milk samples from cows of known brucella status were sent to 6 different laboratories to be tested on the same day by the ring and plate milk agglutination tests using identical procedures. Results showed that neither test is of great value in detecting the stage of immunity of individual cattle vaccinated in different ways with Strain 19 vaccine before breeding age and subsequently exposed to known *Br. abortus* infection. Milk from non-infected cows sometimes gave a positive result, whilst many samples from known infected animals were negative to both tests. The ring test was the more sensitive. Vaccination of calves on a single occasion at 6 months old appeared to interfere least with subsequent ring tests even in the presence of super-

imposed infection, provided the animals in question resisted the challenge. Under field conditions, the possibility of exposure of vaccinated cattle to such a degree of infection would be remote.—A. ACKROYD.

MÜNKER, W. (1958). Untersuchungen über die Brauchbarkeit der Kältekomplementbindungs- und einer quantitativen Mikrokomplementbindungsmethode in der Brucellosediagnostik beim Rind. **[Studies on the use of complement fixation in the cold and a quantitative micro-method of fixation in the diagnosis of brucellosis in cattle.]** — *Zbl. VetMed.* **5,** 33-42. [Summaries in English, French, Spanish and German. Author's summary modified.] **3131**

M. examined 478 sera from cattle for antibodies of *Br. abortus* by slow agglutination, warm and cold complement fixation in tubes, and by a quantitative micro-method of complement fixation.

The greatest number of positive sera was found with the help of the slow agglutination test. In many cases the results of slow agglutination were made clearer or extended by the detection of complement-fixing antibodies.

In comparison with the results of slow agglutination, complement fixation in the cold was superior to complement fixation at 37°C., both in respect of the number of positive results and the titre obtained.

The total results of the micro-method are comparable to those obtained by warm complement fixation in tubes. The micro-method has advantages over tube methods in that it saves material, effort and time.

BÖRGER, K. (1958). Ergebnis der Typendifferenzierung von Brucellastämmen in Schleswig-Holstein. **[Types of brucella isolated from cattle in Schleswig-Holstein.]**—*Rindertuberk. u. Brucellose* **7,** 53-56. **3132**

57 brucella strains were isolated from milk, placentas and foetuses in 25 herds. *Br. abortus* was isolated from 12 herds, *Br. abortus* type III from 5 herds, *Br. suis* from 4, and *Br. melitensis* from 4. All the *Br. suis* strains were from the placentas of animals negative for *Br. abortus* in herds free from *Br. abortus* infection.—M.G.G.

ULLMANN, G. (1958). Brucellose-Rückschläge in Rinderimpfbeständen. Erfahrungen und Vorschläge aus der amtstierärztlichen Überwachung. **[Occurrence of brucellosis in immunized herds.]**—*Rindertuberk. u. Brucellose* **7,** 31-42. **3133**

It is considered that the high titres which are sometimes found in animals vaccinated as calves with Strain 19 are not vaccinal titres but are caused by sensitivity to the presence of small numbers of virulent *Brucella abortus*. The source of these brucella may be infected but non-reacting animals in the same herd. It is proposed, therefore, that sera should be tested for brucella titres before vaccination, for the detection of infected calves; 3 weeks after vaccination, for the detection of non-reactors; and also before mating.

This system of testing was carried out for 4 years in a herd of 120 cows free from brucellosis, where strict hygienic precautions were in force. No recurring high titres in vaccinated animals were found, which indicates that these titres do not occur in the absence of infection. Positive titres in vaccinated animals were found, however, in all of 7 herds in which this system was not used. Virulent brucella was recovered from 2 animals in one of these herds; one animal was a non-reactor.

It is concluded that, because of the possible presence of non-reacting, infected animals, all herds declared free from brucellosis should be tested at least once a year. Persistent low vaccinal titres and titres caused by the sensitivity of vaccinated animals to *Br. abortus* would be taken into account.—M.G.G.

SCHELLNER, H., FEJA, E. & FASSELT, K. (1958). Untersuchungen über Impf- und Infektionstiter bei mit Buck 19 schutzgeimpften Rindern. **[Research on persisting Strain 19 titres and infective titres in cattle immunized against brucellosis.]**—*Berl. Münch. tierärztl. Wschr.* **71,** 7-9. [Summary in English.] **3134**

The flocculation and slow agglutination tests were performed on the sera of 5,948 cattle vaccinated as calves with Strain 19. They were in herds that had been negative to 3 consecutive ring tests at intervals of 4 months. 167 (2·8%) of the sera were considered to be positive. 36 animals had an agglutination titre of 1:80 and were regarded as infected, although 17 were negative to the flocculation test. 96 had an agglutination titre of 1:40 but were negative to the flocculation test, and were therefore regarded as uninfected. 35 had agglutination titres of 1:20 or 1:40 and were positive to the flocculation test. These were regarded as doubtful, but in view of the past history of the herds were not recommended for slaughter.—M.G.G.

REHM, W. & SCHINDLER, R. (1957). Experimentelle Infektionen von Schweinen mit

Brucella abortus. **[Experimental infection of pigs with *Br. abortus*.]**—*Rindertuberk. u. Brucellose* **6**, 144-148. **3135**

Four gilts aged 4 months were each infected with $1{\cdot}6 \times 10^{10}$ organisms of *Br. abortus* Strain 544. Symptoms did not develop, apart from inappetence and fatigue on the 1st and 2nd days after infection. Agglutination tests became positive on the 7th day and titres reached 1:320 in 3 of 4 pigs. 63 days after infection titres had declined to 1:80. The pigs were killed on the 63rd day and cultures of *Br. abortus* were obtained from blood and organs: there was no evidence of change of *Br. abortus* to *suis*.—R.M.

PROHÁSZKA, L. (1958). **Attempts to produce Brucella abortus strains with immunogenic capacity.**—*Acta vet. hung.* **8**, 11-16. [In English. Author's summary modified.] **3136**

By subjecting a virulent *Br. abortus* to ultra-violet radiation it proved possible to isolate a strain which in biochemical properties differed from the original strain. This new strain, designated K/6, is particularly conspicuous for its marked resistance to penicillin and its growth requirements in synthetic medium. With the appearance of the new biochemical qualities the strain changed in virulence. It was found to be of reduced virulence to mice, guinea-pigs, and cattle. To mice it afforded the same protection as Strain 19.

OZAWA, Y. & TAKANAMI, M. (1958). **Studies on the agglutinative substances in anti-brucella serums.** — *Amer. J. vet. Res.* **19**, 500-504. [Authors' summary modified.] **3137**

The authors titrated the *gamma-*, *beta-*, and *alpha*-globulin and albumin fractions of serum from rabbits hyperimmunized against *Br. abortus*. The titres of *gamma-* and *beta*-globulin fractions of serum increased after immunization.

Ultracentrifugal and electrophoretic analyses were made on rabbit serum obtained before and after immunization and on sera obtained from cattle which gave doubtful results to agglutination tests. The same results were observed in both analytical methods.

The fixation test described by Hess & Roepke [*V.B.* **22**, 943] was performed on sera from rabbits and cattle. Reactions occurred in an area between the *gamma*-globulin fraction and the *beta*-globulin fraction.

REUSSE, U. (1958). Zur spontanen und induzierten Rückdissoziation bei Brucellen. **[Spontaneous and induced reversion among brucella.]**—*Zbl. VetMed.* **5**, 329-338. [Summaries in English, French and Spanish. English summary modified.] **3138**

The reversion of M- or R-forms to the S-phase of *Br. abortus* induced by kinetin [6-furfurylaminopurine] which was described by Braun could not be confirmed. Nevertheless, of 8 strains of *Br. abortus*, 3 strains on 5 occasions showed spontaneous mutation from mucoid to smooth.

Theoretically it must be possible, if sufficient sub-cultures were made, to regain the S-forms from each dissociation form of the 3 *Brucella* species.

With the help of single-cell cultures it was shown that the S-forms isolated from mucoid cultures were not present in the inoculum, but were in fact produced by a true mutation.

The reversions were compared with their corresponding S-strain by a variety of methods (morphology, agglutination with acriflavine, inhibition by dyes, production of H_2S, stability in NaCl, slow agglutination, paper chromatography, determination of the dissociation index and virulence determination in mice). Whereas 3 reversions represented typical S-forms and were completely identical with the S-forms of their strains, the reversions of vaccine Strain 19 appeared as two different SL (intermediate) forms. In conclusion, the possibility is discussed of distinguishing Strain 19 from field strains by virulence tests in mice and determining the dissociation index.

TEPPER, B. S. (1957). **The carbon dioxide requirement and virulence of *Brucella abortus* strains.** — *Dissertation, Univ. Wisconsin* pp. 109. [Abst. from abst. in *Diss. Abstr.* **17**, pp. 2125-2126 (1957).] **3139**

Two CO_2-dependent strains and 3 CO_2-independent strains were compared. The rate of uptake of radiophosphorus by the latter strains incubated in 10% CO_2 was 25% greater than that of the same strains incubated in air, and that of the dependent strains. The extra phosphorus uptake was associated with active assimilation of exogenous CO_2.—R.M.

CAMERON, H. S. (1957). **Swine brucellosis.** In "Advances in veterinary science" Vol. III. pp. 275-285. [New York (& London): Academic Press Inc.] **3140**

Swine brucellosis, chiefly caused by *Brucella suis*, is transmitted mainly by contact, the chief sources being the boar or pregnant gilt introduced into a herd. Transmission may be by coitus, or by ingestion. The blood agglutination test is effective in diagnosis on a herd basis, all animals being considered infected if there are any reactors at a titre of 1:100. As porcine brucellosis is a disease of the mature animal,

a clean unit can be built up by weaning progeny as soon as possible and segregating them from the infected herd. Vaccination with Strain 19 is not effective in controlling swine brucellosis.

—A. ACKROYD.

GUERRA, M. (1957). Ricerche sulla persistenza di alcuni caratteri batteriologici e di patogenicità delle brucelle nella panna. **[Persistence of bacteriological and pathogenic properties of brucella in cream.]**—*Boll. Soc. ital. Biol. sper.* **33**, 52-53. **3141**

Cream samples prepared from sterilized cow milk were inoculated, some with *Br. melitensis* and some with *Br. abortus,* and stored at 4°C. The cream was then sown on agar–potato after 1, 2, 4, 6 and 8 weeks. *Br. melitensis* was demonstrable up to the fourth and *Br. abortus* up to the sixth week. The organisms were in the S phase except for one strain of *Br. melitensis* (recovered after 4 weeks) which showed incipient S→R dissociation. Significant skin lesions were observed in rabbits on the sixth day after i/d inoculation with these organisms.—T.E.G.R.

PITAL, A., COOPER, R. E. & LEISE, J. M. (1958). **Rapid method for determining carbohydrate utilization by brucellae.**—*J. Bact.* **75**, 422-425. [Authors' summary modified.] **3142**

An account of a rapid plate method for determining carbohydrate utilization by members of the genus *Brucella,* employing resazurin as an oxidation-reduction indicator, and yielding results within 20–24 hours. All species tested readily utilize glucose, galactose, fructose, and xylose. More extensive studies have shown that maltose and trehalose are utilized by *Br. suis* but not by *Br. abortus* or *Br. melitensis.* In the present work, the latter carbohydrates served to separate *Br. suis* from the other species. Differential sugars for *Br. abortus* and *Br. melitensis* were not found among the carbohydrates tested.

I. MAYER, H. (1957). Experimentelle Untersuchungen über die Brucellose der Schafe. II. Das Aftreten und Persistieren serologisch erfassbarer Antikörper nach künstlicher Infektion mit *Brucella melitensis.* III. Das Fortschreiten der Infektion innerhalb der Herde. **[Experimental studies on brucellosis in sheep. II. Presence and persistence of antibodies after experimental infection with *Brucella melitensis.* III. Progression of infection within a flock.]**—*Rindertuberk. u. Brucellose* **6**, 167-183 & 218-224. **3143**

II. MAYER, H. (1958). Experimentelle Untersuchungen über die Brucellose der Schafe. IV. Der Nachweis agglutinierender Antikörper und die Ausscheidung von Brucellen im Vaginalsekret und mit der Milch von künstlich und natürlich infizierten Schafen. V. Der Nachweis von Brucellen in den Geweben serologisch und allergisch positiv, zweifelhaft oder negativ reagierender Schafe. VI. Das Fortschreiten der Brucella-melitensis-Infektionen und ihr Diagnostik bei Lämmern. **[Experimental studies on brucellosis in sheep. IV. Presence of antibodies and brucella in vaginal secretion and milk. V. Presence of brucella in tissues in relation to serological reactions. VI. Course and diagnosis of infection in lambs.]** — *Ibid.* **7**, 11-20; 21-30 & 43-52. **3144**

I. 15 ewes (6 of them pregnant) and a ram were each infected conjunctivally with 2 million organisms of a freshly isolated strain of *Br. melitensis.* The following serological tests were performed at intervals of 3 or 4 days: agglutination using 15, 5 or 0·85% saline; serum ring test, c.f. test. The earliest detection of antibody was achieved 6 days after infection with the agglutination test using 15% saline and the serum ring test, but the latter was not reliable or easy to assess. Agglutination with 5% saline first occurred after 10 days, while the same test with 0·85% saline and the c.f. test became positive on the 10th day. The persistence of antibodies also depended on which test was used: agglutination with 15% saline remained positive longer than any other test; titres of 1:40 or over persisted for 130–160 days in most cases. Blood culture remained positive, in exceptional cases, 172 and 193 days after infection. Serological tests performed on pregnant and non-pregnant ewes and on the ram all gave similar results.

The spread of brucellosis was particularly rapid in a lambing pen in which half the ewes had been experimentally infected. Spread amongst non-pregnant yearlings in contact with infected yearlings was much slower, and the first case occurred after 68 days. 5 of 13 in-contact sheep remained healthy during the experimental period of 243 days; 4 of them were non-pregnant yearlings.

II. In sheep infected during pregnancy, *Br. melitensis* was present in vaginal secretion for up to 18 weeks and in milk for up to 24 weeks after infection. Agglutinins were demonstrable in all specimens of vaginal mucus and milk which were bacteriologically positive; in isolated cases these persisted for more than 30 weeks after parturition. Agglutinins were best detected by the use of 15% saline in agglutination tests. Because there was no relationship

between the results of serological tests on blood, milk and vaginal mucus, it was concluded that organ-specific antibodies were formed in milk and the vagina.

Brucella was isolated from the organs of 25 of 56 experimentally or spontaneously infected sheep. Agglutination and c.f. tests were both positive in 20 of the 25 sheep. No organisms were isolated from 10 sheep which reacted only to the i/d allergic test. 16 sheep were killed 8 months after infection: brucella was isolated from the organs of 6 of them.

Four of 8 lambs born to infected ewes became infected between 74 and 152 days of age. The agglutination test with 15% saline gave constantly positive results in these animals, but other tests were negative in 3 of the 4; blood cultures were positive in 2 cases. Only one lamb reacted to the i/d allergic test. Brucella organisms were recovered from lymph nodes of the head, neck and intestine; this provided evidence of alimentary infection.—R.M.

RENOUX, G. (1958). La brucellose chez les chèvres. [**Brucellosis in goats.**]—*Arch. Inst. Pasteur Tunis* **35**, 39-48. **3145**

This article summarizes present knowledge on brucellosis in goats, gained from research at the Institut Pasteur, Tunis. The most important modes of transmission are probably dust and infected pasture. Good immunity has been obtained with a killed vaccine (*Br. melitensis* 53 H 38 "smooth") in oily emulsion, which is cheap, stable, and easy to store and handle.

—M.G.G.

RENOUX, G. (1957). **Brucellosis in goats and sheep.** In "Advances in veterinary science" Vol. III. pp. 241-273. [New York (& London): Academic Press Inc.] **3146**

Goats are infected with *Brucella melitensis*, var. *melitensis* and var. *intermedia*, a strain classified by biochemical tests as *Br. melitensis* but by serological tests as *Br. abortus*, and sometimes with *Br. abortus*, whilst sheep are infected with these same strains and by a new one, *Br. melitensis* var. *ovis*, found in Australia and New Zealand and probably Czechoslovakia. In infected goats *Br. melitensis* may be found in every organ, but frequently symptoms are absent. The commonest of these are abortion when the animal is first infected, lameness, mastitis in the female and orchitis in the male. In the recently infected animal, the organism is excreted intermittently in the milk, in the vaginal secretions and probably in the faeces. Kids born to infected dams although apparently healthy are frequently infected even though serologically negative. In sheep, brucellosis is not the main cause of abortion; other symptoms are osteoarthritis, synovitis and nervous signs. All tissues can harbour the organism which is excreted in the milk and vaginal secretions. Sheep can recover from brucellosis. Diagnosis in goats and sheep is by serological and cultural tests on blood, whey or whole milk. Blocking antibody is present in the sera of at least 60% of infected sheep and goats having a negative agglutination test. Full eradication of the disease from sheep and goats depends on serum testing and slaughter, but as a whole flock or herd must be considered infected if a single animal is proved positive. this measure is as yet impracticable and control must depend on the slaughter of reactors, the development of an efficient vaccine and sound farm management.

—A. ACKROYD.

NIZNANSKY, F. (1958). *Brucella intermedia* chez les brebis en Tchécoslovaquie. [*Brucella intermedia* **in sheep in Czechoslovakia.**] —*Arch. Inst. Pasteur Tunis* **35**, 65-77. **3147**

Brucellosis appeared in sheep in South Moravia from 1933 to 1955. It was introduced by imported sheep. Three strains were isolated. Tests of their enzymic activity, antigenic structure, and growth on bacteriostatic media showed them to be *Br. intermedia*.—M.G.G.

BUDDLE, M. B. (1958). **Vaccination in the control of *Brucella ovis* infection in sheep.**— *N. Z. vet. J.* **6**, 41-46. **3148**

S/c injection of an adjuvant vaccine containing formolized *Br. ovis*, or simultaneous inoculation with the adjuvant vaccine and with Strain 19 organisms protected young rams against experimental infection with *Br. ovis*, and against intensive natural infection during the mating season. The immunity afforded by the two vaccines used together was superior to that given by the adjuvant vaccine alone. Reducing the number of killed organisms in the dose of adjuvant vaccine to 6×10^9 (1/10th of the standard dose) did not adversely affect the degree of immunity. 500 ewes, inoculated with adjuvant vaccine 10 weeks before mating with infected rams reared 395 lambs compared with 332 lambs reared by 500 unvaccinated ewes. The numbers of stillborn lambs in the two groups were 12 and 56.—M.G.G.

BIBERSTEIN, E. L. & MCGOWAN, B. (1958). **Epididymitis in rams. Studies on laboratory diagnosis.**—*Cornell Vet.* **48**, 31-44 **3149**

A complement-fixation procedure is described for the diagnosis of the specific bacterial

epididymitis reported in rams in Australia, New Zealand, California, and Central Slovakia. The supernatant of a sonic-vibrated bacterial suspension is used as antigen. This, when compared with the whole cell antigen used by Clapp, gave results which were more consistent with the clinical condition or state of infection or both. Where both tests were positive, higher titres were obtained with the soluble antigen. In 3 infected flocks, positive serum samples were obtained from all clinically abnormal animals, whilst 8 of the 12 clinically normal reactors were proved bacteriologically to be shedders. Stained semen smears were of little value as diagnostic aids. As attempts to eradicate the disease by culling abnormal animals have proved ineffective, this improved c.f. test offers a means of detecting asymptomatic shedders.

—A. Ackroyd.

Rossi, P. & Sendral, R. (1958). Spirochètes et lésions cutanées du porc. [**Spirochaetes in skin lesions of pigs.**]—*Rev. Méd. vét.* **109,** 156-170. [Summary in English.] **3150**

Spirochaetes were isolated P.M. from skin lesions on a young pig from a sty where hygienic conditions were very poor.—T.E.G.R.

Rossi, P. & Devillard, J.-P. (1957). Présence de spirochètes dans des lésions cutanées du porcelet. [**Presence of spirochaetes in skin lesion of piglets.**]—*Bull. Acad. vét. Fr.* **30,** 155-161. **3151**

A case history of deaths of seven piglets on an insanitary farm. P.M. examination was made of one piglet, and two open ulcers of the skin were found to contain a variety of organisms including numerous spirochaetes whose morphology and staining reaction to a limited number of agents is described. It is unknown whether this organism is pathogenic or a contaminant. In the discussion reference was made to the isolation of this organism from skin lesions of other cases.—W. E. Parish.

Fennestad, K. L. & Borg-Petersen, C. (1958). **Studies on bovine leptospirosis and abortion. IV. Demonstration of leptospira in foetuses from field cases in abortion in cattle.**—*Nord. VetMed.* **10,** 302-308. [In English. Summaries in Danish and German. Authors' summary modified.] **3152**

During an epizootic of *L. pomona* infection of cattle on the Danish islands of Lolland and Falster, haemoglobinuria and other clinical symptoms of acute leptospirosis were observed in several cases, and many animals aborted during convalescence. Eight strains of *L. pomona* were isolated from the urine of heifers and cows, and in the only two cases of abortion from which foetal material could be obtained, leptospires were demonstrated in silver-impregnated sections of foetal liver and kidney. This observation supports the hypothesis that leptospiral bovine abortion is most often due to a fatal leptospirosis of the foetus.

Russell, R. R. & Hansen, N. F. (1958). **The incidence of *Leptospira hyos* and *Leptospira pomona* infections in pigs in New Zealand.**—*N. Z. vet. J.* **6,** 50-51. [Authors' summary modified.] **3153**

Of 1,125 sera from apparently healthy pigs examined in the period August 1954 to June 1955, 4% had *L. hyos* titres of 1:200 or higher and 5% had similar *L. pomona* titres. Most of the samples were from the North Island, but the results indicated that both *L. hyos* and *L. pomona* infections were widespread in New Zealand.

I. Morse, E. V., Bauer, D. C., Langham, R. F., Lang, R. W. & Ullrey, D. E. (1958). **Experimental leptospirosis. IV. Pathogenesis of porcine *Leptospira pomona* infections.**—*Amer. J. vet. Res.* **19,** 388-394. **3154**

II. Langham, R. F., Morse, E. V. & Morter, R. L. (1958). **Experimental leptospirosis. V. Pathology of *Leptospira pomona* infection in swine.**—*Ibid.* 395-400. [Authors' summaries modified.] **3155**

I. Twenty pigs were infected with *L. pomona*, 17 by subcutaneous inoculation and 3 by contact. Sixteen were infected with a strain isolated from cattle and 4 with a porcine strain. The only signs of infection were a mild elevation in temperature and a transient anorexia. Blood cell counts, haemoglobin level, and blood non-protein nitrogen remained essentially normal, with the exceptions of slight anisocytosis and reticulocytosis in 2 pigs, and a decrease in both erythrocytes and haemoglobin in one. Leptospiraemia lasted for ten days after inoculation. In three cases leptospires were present in the blood at the time when serum antibody was demonstrable. Serum antibody was still present one year after exposure, although the highest titres were observed at three weeks. The greatest number of leptospires were excreted in the urine 20 to 30 days after exposure. Leptospiruria persisted in at least 2 pigs for 122 days. The various factors influencing leptospiruria, *e.g.* urine pH and urinary *L. pomona* antibodies, were demonstrable after one year, but only weak reactions were observed. Highest titres were seen about three months after exposure. Theories regarding leptospiral haemolytic anaemia and production of urinary leptospiral antibody were discussed.

Weight gains of 10 infected pigs were comparable to those of 10 uninfected litter mates.

II. The pathology of *L. pomona* infection was studied in 15 pigs. Infection sometimes caused widespread renal damage. Grossly, the kidneys showed scattered to numerous greyish white foci in both the cortex and medulla. Microscopically, these foci consisted of numerous lymphocytes, plasma cells, and some macrophages. Some lesions had an increase of fibroblasts and collagenous fibres. The proximal and distal convoluted tubules showed varying degrees of degeneration and necrosis.

FARINA, R. (1958). Contributo alla conoscenza delle leptospirosi del cane. Osservazioni epidemiologiche e cliniche. Ricerche batteriologiche e sierologiche. **[Bacteriological and serological survey of leptospirosis in dogs. Epidemiological and clinical aspects.]**—*Zooprofilassi* **13,** 7-31. [Summaries in English and French.] **3156**

Serum samples from 527 stray dogs and from 212 dogs with various diseases were tested by agglutination against 10 serotypes of leptospira, reactions at dilutions over 1:500 being considered positive. In the first group 175 were positive as follows: 90, *Leptospira canicola;* 78, *L. icterohaemorrhagiae;* 2, *L. grippo-typhosa;* 2, *L. icterohaemorrhagiae* and *L. canicola;* and 1 each, *L. pomona, L. australis, L. sejroesaxkoebing*. In the second group 75 were positive: 35, *L. icterohaemorrhagiae* and 40, *L. canicola*. The high incidence of *L. canicola* is briefly discussed. This organism is rarely responsible for acute disease but generally causes chronic inapparent forms of infection associated with chronic interstitial nephritis. Details are given of 5 cases of Stuttgart disease and of 32 cases of Weil's disease and of their epidemiology, clinical manifestations, immunology, pathology and treatment. *L. icterohaemorrhagiae* was isolated from the blood and urine of 10 sick dogs and from 17 of 53 rats caught in the area under survey.—T.E.G.R.

GALTON, M. M., POWERS, D. K., HALL, A. D & CORNELL, R. G. (1958). **A rapid macroscopic-slide screening test for the serodiagnosis of leptospirosis.** — *Amer. J. vet. Res.* **19,** 505-512. [Authors' summary modified.] **3157**

A simple method for the preparation of leptospiral macroscopic slide-agglutination test antigens is described. Different lots of antigens prepared from six leptospiral serotypes were found to be stable for nine months or longer with little or no variation in sensitivity. Antigens for a total of 12 serotypes are used routinely. Comparative tests on sera from 138 human beings, 1,249 cattle, 265 dogs and 80 pigs indicated that the slide test is as sensitive as the microscopic agglutination test. For rapid screening, the 12 antigens combined into four pools of three antigens each.

SMITH, L. D. S. (1957). **Clostridial diseases of animals.** In "Advances in veterinary science" Vol. III. pp. 463-524. [New York (& London): Academic Press Inc.] **3158**

The diseases caused in animals by the anaerobic spore-forming bacteria, the clostridia, are described. These organisms have two primary habitats, the soil and the intestinal contents of apparently normal animals; it is thus impossible to eradicate them, but losses can be reduced by a regular vaccination with killed cultures or with toxoids. The diseases associated with clostridia comprise bacillary haemoglobinuria, a disease primarily of cattle caused by the growth of *Cl. haemolyticum* in the liver infected with liver fluke. Black disease (infectious necrotic hepatitis), an acute localized infection of the liver primarily of mature sheep in good condition caused by *Cl. oedematiens* and also associated with liver fluke or other parasitic liver infestation. Blackleg, caused by the growth of *Cl. chauvoei* in muscle; it occurs most frequently in animals on a high level of nutrition. Braxy of sheep, now rarely encountered, is caused by *Cl. septicum*. The characteristic lesion is ulceration of the mucosa of the wall of the abomasum. Clostridial wound infections (malignant oedema and gas gangrene) can develop after even minor wounds. Tetanus is caused by the neurotoxin produced by *Cl. tetani* when it grows in the animal body. Enterotoxaemia, principally of very young ruminants, results from the absorption into the blood stream of toxins produced in the intestines by *Cl. welchii,* Types B, C, or D. The characteristic lesion is a haemorrhagic enteritis with ulceration of the intestinal mucosa. In sheep of all ages, enterotoxaemia due to Type D is associated with the heavy intake of nutritious food. Finally botulism is a toxaemic disease with a marked regional distribution caused by ingestion of the toxin of *Cl. botulinum* Types A, B, C, and D, that of Type D being the most toxic. Outbreaks have been recorded in cattle, sheep, horses, mink, dogs, ducks, chickens, turkeys, and pheasants. Botulinum toxin produces paralysis by acting on those parts of the peripheral nervous system whose action is mediated by acetylcholine.—A. ACKROYD.

CICHETTI, R., CREMONESI, G. & GIOIA, V. (1958). La trasmissione della immunità

antitetanica da madre a figlio nel cavallo. **[Transfer of immunity against tetanus from dam to foal.]**—*Vet. ital.* **9,** 10-17. [Summaries in English, French and German.] **3159**

Specific antibodies, in titres higher than those normally considered sufficient for prophylaxis, were demonstrated 3–4 hours after birth in the blood of 7 of 8 foals born to immunized dams. Immunity increased during the first days of life (as a result, it is considered, of the intake of antitoxin with the colostrum) and lasted for over a month.—T.E.G.R.

LAURENCE, D. R., BERMAN, E., SCRAGG, J. N. & ADAMS, E. B. (1958). **A clinical trial of chlorpromazine against barbiturates in tetanus.**—*Lancet* May 10th, 987-991. **3160**

In a clinical trial on 75 tetanus patients treatment with chlorpromazine yielded similar results to treatment with barbiturates (phenobarbitone sodium or amylobarbitone sodium). Chlorpromazine was easier to manage than barbiturates because it controlled tetanus convulsions without causing loss of consciousness or clinically noticeable respiratory depression. —R.M.

RISTIC, M., WHITE, F. H. & SANDERS, D. A. (1957). **Vibrio fetus infections.**—*Ann. Rep. agric. Exp. Sta., Univ. Fla,* 1956 pp. 144-145. **3161**

Cultures of *V. fetus* from cattle, sheep and man contained one smooth : four rough colonies. Cross agglutination revealed strain specificity in the case of smooth but not of rough variants. The misinterpretation and uncertainty of serological tests is attributed to different antigenic structure of smooth and rough colonies and to the changes occurring in mutation. The antigenic relationship was clarified by control of the various resultant types used in the preparation of antigens and antisera. The "acriflaven" agglutinability technique, in addition to differentiation of colonies, is considered practical for the study of the dissociative stage of *V. fetus* cultures.—T.E.G.R.

ANON. (1958). **The pathogenicity of *Vibrio fetus*.**—*Vet. Rec.* **70,** 393-400. **3162**

The clinical and experimental evidence of the pathogenicity of *V. fetus* is reviewed. In addition to abortion in the cow as a result of pathological lesions in the foetal membranes, infection of the semen of bulls causes a relative herd infertility owing to the great increase in the number of services required per conception. Besides its distinctive morphology and its need for a reduced oxygen tension for growth, this vibrio, the so-called Group I, can be identified by being catalase-positive, not producing hydrogen sulphide (H_2S), reducing nitrate to nitrate, and not fermenting sugars. Group II vibrios which are catalase-negative and produce H_2S are frequently isolated from the semen of bulls but are non-pathogenic. A third group which is both catalase-positive and produces H_2S and is related antigenically to the Group I vibrios has been described. It causes sporadic abortions not associated with herd infertility. —A. ACKROYD.

THOMAS, J. H. (1958). **The treatment of contagious footrot of sheep, with special reference to the value of Terramycin.**—*Aust. vet. J.* **34,** 33-37. [Author's summary modified.] **3163**

The sensitivity of *Fusiformis nodosus* to Chloromycetin, Terramycin and Polymyxin B was tested by a standard method; sensitivity to Terramycin was slightly less than to Chloromycetin, but Polymyxin B produced little inhibition of growth.

These antibiotics and some other medicaments used for the treatment of foot rot were tested on sheep at the laboratory.

Field trials showed Chloromycetin and Terramycin to be more effective under dry conditions. One application of 0·5%, 1%, 2% and 5% Terramycin in methylated spirits cured 88%, 89%, 99% and 100% of 94, 47, 123 and 105 affected feet respectively, whereas 5% Chloromycetin cured 92% of 104 affected feet after one treatment.

In another field trial under wet conditions 0·5% Terramycin cream with 10,000 units of Polymyxin B sulphate per g. and 5% Terramycin in methylated spirits cured 61% and 77% of 23 and 191 affected feet after one treatment respectively. In the same trial 5% Chloromycetin cured 67% of 50 affected feet after one treatment, whereas 10% Chloromycetin cured all of 24 feet after one treatment.

It was concluded that Terramycin in concentrations up to 5% in methylated spirits had no advantage over 10% Chloromycetin and its instability was a disadvantage in its practical application.

WORSECK, M., SZABÓ DE BUCS, E. & HEMLEP, I. (1958). Einwirkung energiereicher Strahlen auf Escherichia coli und Staphylococcus aureus. **[Action of high energy radiations on *Escherichia coli* and *Staphylococcus aureus*.]**—*Zbl. VetMed.* **5,** 391-404. [Summaries in English, French and Spanish. Authors' summary modified.] **3164**

The authors studied the effects of X-rays on 30 strains of *E. coli* and 30 of *Staphylococcus,* using two radiotherapy sets as the source of the rays. Data were obtained on the relative sterilization value; the absolute tangent for definition of the method of destruction; the mean lethal dose. It was found that staphylococci were more resistant to radiation than coliforms. With the help of the absolute tangent it was possible to designate the resistance and sensitivity of organisms to radiation.

JENNINGS, J. C. & OLSON, B. H. (1958). **The bactericidal action of synnematin B.**—*Antibiot. & Chemother.* **8,** 245-249. [Authors' summary modified.] **3165**

Synnematin B was shown to have marked bactericidal properties. Cultures of *S. typhi, S. typhi-murium, Str. haemolyticus,* and *P. vulgaris* were sterilized. Freshly isolated cultures of *S. typhi* were sterilized after 72 hours with as little as 1·5 units/ml. Growth of *Staph. pyogenes* and *Br. abortus* was inhibited but the cultures were not sterilized within 72 hours by the highest conc. employed. Concentrations of the antibiotic equivalent to the *in vitro* sensitivity killed more than 99% of the organisms with an eight hour exposure.

The bactericidal action of synnematin B was found to be a function of antibiotic concentration, time, and inoculum size. With a fixed exposure time, each increase in inoculum size had to be compensated by an increase in antibiotic concentration to bring about complete sterilization of the culture.

HAUFFE, W. (1958). Praxisversuche zur Behandlung seuchenhaft auftretender Erkrankungen der Hühner mit spritzbaren Antibiotika. **[Treatment of some epidemic diseases of poultry with injections of antibiotics.]** — *Prakt. Tierarzt* No. 2. pp. 44-46 & 48. **3166**

In epidemic infections of the upper respiratory tract of poultry, such as contagious coryza, diphtheria and tracheitis, where the aim is to achieve control by a single injection, a suspension of oxytetracycline with or without the addition of "Omnadin" [a protein product], polymyxin B or streptomycin, was found to be a highly satisfactory therapeutic agent, being superior to tetracycline, streptomycin and sulphadimidine, also given by injection.

—G. P. MARSHALL.

HAWK, H. W., KIDDY, C. A., WILSON, J. B., ESPOSITO, M. & WINTER, A. J. (1958). **Bacteriological studies of uteri of clinically normal cows of low fertility.**—*J. Dairy Sci.* **41,** 120-128. [Authors' summary modified.] **3167**

This study was undertaken to determine if the uteri of clinically normal infertile cows contained micro-organisms at sixteen days after service, which marks the beginning of a period associated with high incidence of embryonic death. 69 infertile cows were slaughtered, the uteri removed asceptically, and flushed with 15 ml. of 0·1% tryptone broth. Various media were inoculated with the recovered fluid and incubated in air, in 15% CO_2 and reduced air, and in an anaerobic jar. Triturated endometrial tissue of 35 animals in the study was similarly cultured. Micro-organisms were recovered from 8 uteri of eight. A yeast, *Candida krusei,* was isolated from four uteri, an *Escherichia* species from one, and a paracolon from one. Embryos were recovered from 31 of 62 uteri from cows with anatomically normal reproductive tracts; three embryos were recovered from the eight infected uteri. Vaginal mucus samples were obtained from 35 of the animals at 11, 13 and 16 days after service. One cow had a positive mucus agglutination test for *Vibrio fetus.* Serum agglutination lysis tests for leptospirosis were negative in all animals. Microbial infection apparently accounted for few of the embryonic deaths in these cows.

COOK, T. M. & PELCZAR, M. J., JR. (1958). **Detection of hydrogen sulfide production by bacteria using paper disc methods.**—*Appl. Microbiol.* **6,** 193-197. **3168**

Paper disks impregnated with various reagents for detecting H_2S production by members of the Enterobacteriaceae were compared. A suitable disk contained 1 mg. sodium thiosulphate and 1 mg. ferric ammonium citrate and was used on the surface of trypticase agar. Paper disk tests agreed with conventional methods in all organisms tested except *S. pullorum,* which gave inconsistent results with the disks.—R.M.

HERBST, E. J., WEAVER, R. H. & KEISTER, D. L. (1958). **The Gram reaction and cell composition: diamines and polyamines.** — *Arch. Biochem.* **75,** 171-177. **3169**

Gram-negative micro-organisms stored and excreted variable quantities of putrescine, a microbial growth factor: Gram-positive organisms did not.—R.M.

VAN UDEN, N., BRAÇO FORTE, M. C., JR. & DO CARMO SOUSA, L. (1958). Apparition de "Cryptococcus neoformans" dans le tractus

intestinal du cheval. [*Cryptococcus neoformans* **in the intestinal tract of the horse.**] — *Bull. Off. int. Epiz.* **49**, 257-273. **3170**

Cultures from the caecum of 252 healthy horses at the abattoir in Lisbon yielded 145 strains of fungi which grew at 37°C. and among them was a single strain of *Cryptococcus neoformans*. The authors studied the morphology and physiology of this strain and its pathogenicity in mice. They also studied the ability of the strain and of 22 other strains from Europe and America to ferment carbohydrates, as well as their vitamin requirements and the maximal temperature at which they could be grown. As the organism can survive as a saprophyte in the intestine of the horse, this animal may serve as a vector for its dissemination.

—E. G. White.

Fazekas, G. & Schwarz, J. (1958). **Histology of experimental murine cryptococcosis.** — *Amer. J. Path.* **34**, 517-529. [Authors' summary modified.] **3171**

The lesions in mice inoculated with *Cryptococcus neoformans* were described. The strains of cryptococcus used were isolated from pigeon nests in the Cincinnati area. Brain and lungs were the most frequent sites of lesions. The histological pattern varied from organ to organ even in the same animal. The heart muscle failed to respond with inflammation to the invasion by yeast cells.

Lewis, D. G. (1958). **A case of visceral blastomycosis in the dog.**—*Vet. Rec.* **70**, 298. **3172**

The death of a dog was attributed to *Blastomyces dermatitidis* infection, diagnosis being based on microscopic examination of tissue smears.

There were lesions in the liver and kidneys and the symptoms resembled those of virus hepatitis with secondary nephritis.

—E. G. White.

Behal, F. J. & Eakin, R. E. (1958). **Biochemical studies of differentiation in *Aspergillus niger*.**—*Fed. Proc.* **17**, 188. **3173**

The authors studied the effect on the growth and development of *A. niger* of a large number of compounds related chemically to kinetin and to nucleic acid. Four compounds which had a specific effect were found and one of them, 6-ethylthiopurine, which inhibited spore formation, was studied intensively.

—E. G. White.

Chute, H. L. & O'Meara, D. C. (1958). **Experimental fungous infections in chickens.** —*Avian Diseases* **2**, 154-166. [Authors' conclusions modified.] **3174**

Different strains of fungi, particularly aspergilli, have different degrees of pathogenicity. Different fungi were observed to produce different mycelial morphology in body tissue. Granulomas form rapidly as a reaction to injury from some species of spores in the air-sacs and lungs. Bone-marrow sections did not reveal aplastic anaemia in birds infected with any of the fungi studied.

With the following cultures which were inoculated into the abdominal air-sac, both spores and mycelia were present in tissues: *Paecilomyces varioti, Penicillium roqueforti, P. brevicompactum, Aspergillus glaucus* groups, *Trichoderma* spp. *Trichoderma koningi, Penicillium oxalicum, Aspergillus fumigatus, Alternaria* spp., *Penicillium islandicium, Stemphylillus* spp., and *Penicillium cyclopium*.

The following cultures showed only spores in tissues: *Scopulariopsis brevicaulis, Hormodendrum* spp., *Aspergillus niger, A. clavatus, Penicillium lilacenum, Aspergillus candidus, Penicillium stoloniferum, Trichophyton* spp., *Penicillium chrysogenum*, and *Aspergillus restrictus*.

Although a few spores were observed in the tissue for as long as six weeks, generally none remained after four weeks. Air-sac inoculation was found to be a rapid and efficient method of screening fungi for pathogenicity in birds. *Aspergillus fumigatus* and *Trichoderma* spp. (near *T. glaucus*) appeared to be the most pathogenic.

Dafaalla, E. N. & Gharib, H. M. (1958). **A study of mastitis in a goat caused by *Nocardia asteroides*.**—*Brit. vet. J.* **114**, 143-145. **3175**

Nocardia asteroides was identified as the causal agent of a caseating granulomatous mastitis affecting one half of the udder of a goat in the Republic of the Sudan. This is believed to be the first time this species has been isolated from a goat. *N. caprae* has been found in goats in several countries, and *N. farcinicus* and *N. canis* are known to occur in the Sudan.

—E. G. White.

Crawford, W. P., Wheeler, H. O., Reid, B. L., Ferguson, T. M., Rigdon, R. H. & Couch, J. R. (1958). **Microflora of pendulous crop in turkeys.**—*Fed. Proc.* **17**, 474. **3176**

Pendulous crop was produced in turkeys by feeding a synthetic diet with glucose monohydrate as the source of carbohydrate, and plate counts of the crop contents were studied. An enormous increase in yeasts occurred, with up to

15×10^6 organisms/ml. crop fluid. The three predominant species were *Candida albicans, Saccharomyces tellustris* and *Torulopsis glabrata*. Birds with pendulous crop showed a higher blood alcohol (0·76 mg./ml.) than birds fed starch (0·25 mg./ml.) or birds on a practical diet (*nil* or a trace).—E. G. WHITE.

COLE, G. C. (1957). **Characterization of an agent isolated from swine arthritis.**—*Dissertation, Univ. Wisconsin* pp. 237. [Abst. from abst. in *Diss. Abstr.* **17**, 2378.] **3177**

C. studied an agent lethal for chick embryos, isolated from arthritic joints of pigs. The agent was propagated in embryonating hens' eggs, in foetal bovine lung, swine lung and in chick embryo lung-cell tissue cultures and in solid and liquid cell-free media.

The forms observed in electron photomicrographs of semi-purified allantoic-amniotic fluid suspensions of the arthritis agent suggested that the agent belonged to the pleuropneumonia-like group of organisms.

In ovo methods were used to test the sensitivity of the agent to the bacteriostatic effects of antibiotics, rapid changes in ambient osmotic pressure and pH of 10^{-4} to 10^{-8}.

During these studies, three isolates of non-bacterial agents, lethal for chick embryos, were made by a colleague from field cases of pleurisy and peritonitis in pigs. These agents and the arthritis agent were experimentally inoculated into, and isolated from, young pigs, mice and chicks. No signs of infection were observed in the mice and chicks, but peritonitis, pleuritis and, at times, arthritis, were observed in the pigs.—R.M.

CHARLES, R. T. & REES, O. (1958). **Use of sulphonamides in the treatment of pleuropneumonia-like organism in rats.**—*Nature, Lond.* **181**, 1213. **3178**

A lung infection affecting a high proportion of otherwise healthy laboratory rats, for which pleuropneumonia-like organisms are believed, but not proved, to be responsible and against which penicillin had proved ineffective, had its mortality rate reduced from 60 to 2% of animals by treatment with sulphadimidine 0·1 ml. per 100 g. i/p, followed by triple sulphonamide (sulphamerazine, sulphadiazine and sulphapyridine) 0·2% in the drinking water. Prophylactic trials with these drugs were said to be yielding encouraging results.—G. P. MARSHALL.

I. ADLER, H. E., FABRICANT, J., YAMAMOTO, R. & BERG, J. (1958). **Symposium on chronic respiratory diseases of poultry. I. Isolation and identification of pleuropneumonia-like organisms of avian origin.**—*Amer. J. vet. Res.* **19**, 440-447. **3179**

II. GROSS, W. B. (1958). **Symposium on chronic respiratory diseases of poultry. II. The role of *Escherichia coli* in the cause of chronic respiratory disease and certain other respiratory diseases.**—*Ibid.* 448-452. **3180**

III. VAN ROEKEL, H., OLESUIK, O. M. & BENINATO, L. P. (1958). **Symposium on chronic respiratory diseases of poultry. III. Epizootiology of chronic respiratory diseases in chickens.**—*Ibid.* 453-463. **3181**

IV. JUNGHERR, E. L. (1958). **Symposium on chronic respiratory diseases of poultry. IV. The control of chronic respiratory disease.**—*Ibid.* 464-467. **3182**

V. OSBORN, O. H. & POMEROY, B. S. (1958). **Symposium on chronic respiratory diseases of poultry. V. Infectious sinusitis of turkeys.**—*Ibid.* 468-472. [Authors' summaries modified.] **3183**

I. The literature on the isolation and identification of pleuropneumonia-like organisms (PPLO) of avian origin is reviewed briefly, and the techniques used at the University of California are described. Non-pathogenic PPLO were isolated from fowls. They were not related serologically to the standard pathogenic strain (S_6) which was isolated from turkeys and which has been widely used for antigen production. A number of PPLO isolated from newly hatched poults with air sac infection did not ferment carbohydrates. These isolates were of one type and were not related antigenically to the standard pathogenic strain.

Since PPLO with antigenic, physiological, and pathogenic characteristics differing from the standard pathogenic strain have been isolated from fowls and turkeys, it is evident that procedures for the detection of PPLO infections in poultry should be re-evaluated, and that the pathogenicity for birds of PPLO isolated from avian tissues must be determined.

II. Certain types of *E. coli* are important complicating factors in chronic respiratory disease and other respiratory diseases. Infection with aerosols is the easiest mode of infection and is probably most important naturally. At certain periods in the course of respiratory diseases, fowls or turkeys are more susceptible to *E. coli* aerosols. These periods are characterized by increased lymphoid proliferation in the respiratory tract lesions. At the periods of greatest susceptibility, small numbers of *E. coli* bacteria in an aerosol can produce pericarditis, and increasing the concentration of *E. coli* in the

aerosol does not increase the incidence of pericarditis. The injection of as few as seven bacteria into an air sac can result in infection.

The incidence of pericarditis can be increased by adding India ink, PPLO propagated in yolk or medium, infectious bronchitis virus or Crawley virus to the inoculum, or by increasing the concentration of *E. coli* bacteria.

III. Among the modes of transmission of chronic respiratory diseases transovarian infection was a common mode of transmission from one generation to the next. Antibiotics administered to infected dams did not appear to inhibit the elimination of the agent by way of the egg. Partial flock testing may be unreliable in determining the disease status of the flock, consequently the infection may spread from untested birds. In commercial flocks the disease may become widespread before sexual maturity of the birds. This creates a difficult control problem.

IV. Proposed methods for the control of chronic respiratory disease aim at the eradication of PPLO infection from the breeding stock. Segregation of breeding stock into positive and negative birds, by serological tests for PPLO, has not been practical because the negative birds often rapidly become positive.

Sampling of batches of chicks by serological tests is useful for recognizing batches with the least reactors. Such batches may be given parenteral treatment with streptomycin. Parenteral treatment of parent stock seems to result in a low proportion of offspring which react to PPLO serological tests up to 10 weeks of age or more; such treatments should be repeated every two weeks. The procedure is useful for the production of broiler fowls with a small tendency to develop CRD.

For production of replacement stock, hatches from promising parent stock units should be kept in relative isolation, in batches not exceeding 500 birds. They should be moved as little as possible. The introduction of negative males from positive units into PPLO-free female units is dangerous. Promising batches of prospective foundation stock should be subjected to bimonthly blood tests, beginning with a sample test of 10% of birds at the age of 8 to 10 weeks. In apparently PPLO-free batches, it is advisable to take tracheal swabs of 10 or more birds for PPLO cultural tests.

Increased ventilation decreases the spread of PPLO and ameliorates the course of CRD. Superinfection with infectious bronchitis virus (and probably other agents) intensifies and prolongs PPLO infection and should be avoided.

Under natural conditions, avian PPLO occur as haemagglutinating and non-haemagglutinating types; the former are usually of high pathogencity, and the latter are of low pathogenicity.

V. Infectious sinusitis is an important problem of the turkey industry and little progress has been made in reducing incidence.

Advances in knowledge of the aetiological agent, modes of transmission, and control were discussed. Development of a control programme awaits further study on the effectiveness of the serological tests in detecting carrier flocks.

VAN ROEKEL, H., GRAY, J. E., SHIPKOWITZ, N. L., CLARK, M. K. & LUCHINI, R. M. (1957). **Etiology and pathology of the chronic respiratory disease complex in chickens.**—*Bull. Coll. Agric. Univ. Massachusetts* No. 486. pp. 94. [Authors' summary modified.] **3184**

In this study 268 fowls from 69 flocks affected with respiratory disease were examined.

Outbreaks of CRD may occur without apparent stress factors although Newcastle disease and infectious bronchitis, either through vaccination or the natural infection, may precipitate the disease. The value of antibiotic therapy in natural outbreaks was very questionable. In some outbreaks *E. coli* infection was a significant complicating problem whereas mycotic infections were insignificant.

Approximately half of the fowls and turkeys experimentally inoculated with tracheal exudate suspensions obtained from field cases developed respiratory symptoms. Experimentally inoculated birds sometimes did not show symptoms, but lesions were found at P.M. examination. The CRD agent could be isolated more readily in adult birds than in embryos.

Lymphofollicular and exudative-granulomatous reactions were recognized as the characteristic pathological response in CRD infected chickens. The lymphofollicular reaction was often seen as a beaded appearance of the mucosa of the upper respiratory tract and the membranous air-sacs. The involvement in the paranasal sinuses and trachea consisted of mucosal thickening which was proportional to the degree of infiltration by lymphocytes and mononuclear phagocytes, hyperplasia of mucous glands, production of mucinous exudate, and eventual epithelial degeneration. The inflammatory reaction in the lungs was usually located in the bronchi adjacent to the intrapulmonary primary bronchus. Microscopically, focal lymphoid hyperplasia related to the tertiary bronchi and septal tissue was regarded as characteristic. The respiratory lining of the

air-sacs was usually coated with varying degrees of pale yellow fibrinocellular exudate that occasionally showed granulomatous organization.

Pathological involvement of the serosa of the abdominal viscera and the heart, similar to that of the air-sacs, was usually associated with a secondary bacterial infection due to coliform organisms. Extra-respiratory lesions were seldom observed in experimentally transmitted CRD.

In a sampling of 127 chick embryos used for transmission experiments, the most distinguishing findings were exudate in the respiratory tract and subcutaneous necrotic foci. The embryonic lesions were usually observed during the third week of incubation and at hatching time.

Turkeys were apparently more sensitive than fowls to infection by the PPLO of CRD. The pathological response was usually characterized by a greater production of exudate and a more diffuse and intense infiltration of the respiratory system by inflammatory cells.

DOMERMUTH, C. H. (1958). **A direct enumeration of pleuropneumonia-like organisms.**—*Avian Diseases* **2**, 147-153. [Author's summary modified.] **3185**

Avian pleuropneumonia-like organisms (Van Roekel strain) stained on glass slides were counted directly by microscopic examination. The average difference from the mean count for two operators counting was 2%.

PPLO which had been cultivated on four different media were prepared for counting by centrifuging at 14,000 times gravity for 30 min. at 6°C. and resuspension in distilled water to one-tenth the original volume. The resuspended material was used to prepare Giemsa stained preparations for direct counting. Viable counts on homologous media and percentage light-transmission data (electrophotometer) were also obtained. Direct microscopic count and viable count were in agreement with the other data; this may have been due to the composition of the media used.

SMITH, P. F. & SASAKI, S. (1958). **Stability of pleuropneumonialike organisms to some physical factors.** — *Appl. Microbiol.* **6**, 184-189. **3186**

One strain from chronic respiratory disease of fowls and 4 human strains were examined. Alternate freezing and thawing resulted in considerable destruction of organisms suspended in water, but not when suspended in saline. They survived freeze-drying in culture medium but not in distilled water. Osmotis shock did not appear to kill the organisms. They survived only a few hours at temp. above 4°C when suspended in solutions other than culture medium. Survival at refrigerator temp. extended over several weeks.—R.M.

CONRAD, R. D. (1958). **Lyophilization of avian pleuro-pneumonia-like organisms.** — *Avian Diseases* **2**, 132-138. [Author's summary modified.] **3187**

An isolate of P.P.L.O. of avian origin, adapted to artificial cultural medium was freeze-dried. Approximately 23·8% of the population remained viable after 27 months' storage at 4°C. Of three isolates of P.P.L.O. lethal for embryonating hens' eggs, the LD_{50} log. titres were reduced 1·13, 1·48 and 1·43, 96 hours after freeze-drying.

The possible relationship of avian respiratory vaccines contaminated with P.P.L.O. to the spread of chronic respiratory disease is discussed.

I. OSBORN, O. H. & POMEROY, B. S. (1958). **The effect of antibiotics on the infectious sinusitis agent of turkeys : Part I. Egg transmission.** — *Avian Diseases* **2**, 180-186. [Authors' summary modified.] **3188**

II. RICHEY, D. J., BARNETT, B. D., BOONE, M. A. & MORGAN, C. L. (1958). **Transmission and control of infectious sinusitis in turkeys.** —*Ibid.* 173-179. [Authors' summary modified.] **3189**

I. Prolonged high level antibiotic therapy of turkey hens did not prevent egg transmission of the infectious sinusitis agent to their progeny. The progeny were found to have "air-sac" lesions and were found to be carriers of the pleuropneumonia-like organism. A significant reduction of lesions was observed in the poults and late embryos derived from the birds which were given antibiotic therapy. No clinically observable infectious sinusitis could be produced in the progeny by infecting the poults with various viruses.

II. Pathogenic pleuropneumonia-like organisms were isolated from dead in shell and culled poults produced by turkey hens with sinusitis. In 300 of the hatched poults, an outbreak of sinusitis and lower respiratory tract infection occurred at 3 weeks of age. Treatment of 113 affected birds with streptomycin plus dihydrostreptomycin sulphate gave variable results during an observation period of 20 weeks. Infected and treated birds averaged about the same weight as non-infected stock at the termination of the experiment.

BENTON, W. J. & COVER, M. S. (1958). **Experimental treatment of infectious sinusitis in turkeys with nitrofurans and antibiotics.**—*Amer. J. vet. Res.* **19**, 489-493. [Authors' summary modified.] **3190**

Three nitrofurans were administered by inhalation, in the drinking water, and injection into the infraorbital sinuses; streptomycin or 4% aqueous soln. of silver nitrate was injected into the sinuses. Those drugs which were injected directly into the sinus were effective with the exception of silver nitrate and, in 1 of 2 experiments, streptomycin, but drugs administered by dusting or in drinking water were ineffective.

TÄUBRICH, F. (1958). Die Bakterienflora der Vagina des gesunden Rindes unter Berücksichtigung des Geschlechtszyklus, der Trächtigkeitsphase, des Alters und des pH-Wertes. **[Bacterial flora of the vagina of healthy cows in relation to the oestrous cycle, stage of pregnancy, age and pH value.]**—*Zbl. VetMed.* **5**, 373-390. [Summaries in English, French and Spanish. Author's summary.] **3191**

In a study of 108 cows from three herds, about 20% showed no organism in smears made from vaginal swabs. In the other animals about 65% showed alpha-haemolytic streptococci, 40% micrococci, 14% coliforms, 7% diphtheroids and 2% anthracoid organisms.

The streptococci comprised *Str. acidominimus* 87%; enterococci 7%; *Str. salivarius* 4%; *Str. uberis* 2%. The number of streptococci was often many times that of other organisms. All the micrococci were non-pathogenic and belong mainly to the species *M. aurantiacus, M. epidermidis, M. albus* and *M. candidus*. The coliform organisms belong to the Escherichia group, but they were not often present. Very few diphtheroid and anthracoid organisms were encountered. The vaginal flora of the cow did not show any correlation whatever with pH, age or stage of the sexual cycle.

ANON. (1958). **The national collection of type cultures: catalogue of species.**—*Med. Res. Coun. Memor.* No. 35, pp. 34. London. H. M. Stat. Off. 2s. 6d. **3192**

This catalogue gives only representative strains of the different species of bacteria kept in the national collection of type cultures. In general, the strain listed first under each species has cultural and serological characters typical of that species; other strains with certain stated characters or special uses are also listed by number but serotypes though available, are not shown. The names used are those adopted and/or recommended by the International Committee on Bacteriological Nomenclature and those that by a reasonable interpretation of the Rules of the Bacteriological Code, are considered to be probably correct. Information is given regarding conditions of supply of dried cultures. The catalogue contains a list of genera and species and a list of individual strains for special tests. A list of other collections of microorganisms in the United Kingdom is also included.—T.E.G.R.

See also absts. **3359** (oedema disease of pigs); **3373** (diseases of c.n.s.); **3378** (B. megatherium and B. cereus); **3429** (bacteriological examination of meat); **3458** (report, Gt. Britain); **3459** (report, New Zealand); **3460** (report, Nyasaland); **3461** (report, Belgian Congo); **3462** (book, TB.); **3467** (book, Congress Proceedings).

DISEASES CAUSED BY PROTOZOAN PARASITES

CASTILLO, A. M. & JOAQUIN, Z. B. (1955). **Studies on surra: I. The blood sugar level and the effect of glucose injections on rats infected with *Trypanosoma evansi*.**—*Philipp. J. Anim. Ind.* **16**, 189-196. [Authors' summary modified.] **3193**

The blood sugar and trypanosome counts of rats infected with *T. evansi* are given.

The blood sugar seems to decrease with the increase of organisms in the blood. Hypoglycaemia, noted after the third day of infection, became gradually more severe until the animal died, but whether this was solely responsible for death cannot be determined with certainty. Glucose injections failed to prolong the lives of infected rats.

WILLETT, K. C. & GORDON, R. M. (1957). **Studies on the deposition, migration, and development to the blood forms of trypanosomes belonging to the *Trypanosoma brucei* group. II. An account of the migration of the trypanosomes from the site of their deposition in the rodent host to their appearance in the general circulation, with some observations on their probable routes of migration in the human host.**—*Ann. trop. Med. Parasit.* **51**, 471-492. **3194**

The authors followed up earlier studies on the local processes involved when the tsetse fly feeds on the host. Using trypanosomes of the *T. brucei* group they observed the fate after deposition in the tissues and in the general cir-

culation in rats, g.pigs and rabbits. The experiments were concerned with the interval between inoculations of the metacyclic forms and the appearance of trypanosomes in the blood.

Blood forms of *T. rhodesiense* or *T. brucei* inoculated s/c or i/d into rats did not multiply at the site of inoculation. They appeared in the general circulation from at least the third day and persisted. After i/d inocn. into rabbits they persisted and multiplied at the site of inocn. and produced a chancre. They also appeared in the general circulation throughout the incubation period and persisted. When blood forms of *T. brucei* in (a) heart blood, (b) tissue from the site and (c) tissue from a remote site, were inocd. i/d into rats daily throughout the period of incubation, only three positive results were obtained; from heart blood on the third and fourth days and from tissue from the site at the third day.

Tsetse flies infected with the metacyclic forms of *T. brucei* were allowed to feed on g.pigs. There was no local development and no chancre formation. Blood taken after 5 min., 1½ hours and 24 hours was infective.

Metacyclic forms of *T. rhodesiense* injected directly into the general circulation of rabbits, precautions being taken to prevent tissue contamination, persisted and multiplied in the blood throughout the incubation period.

Tsetse flies infected with *T. rhodesiense* were allowed to feed on rabbits; a local chancre developed and in its later stages it contained very numerous trypanosomes; they rapidly invaded the general circulation and multiplied and persisted throughout the incubation period.

Two tsetse flies with metacyclic forms of *T. rhodesiense* were allowed to feed on a human volunteer. Although a total of 425 ml. of blood was used for examination in the two days following, no viable trypanosomes were demonstrated.

The authors concluded that the process of migration and development of trypanosomes of the *T. brucei* group in the mamalian host during the incubation period are fundamentally the same, whether metacyclic or blood forms are inoculated into either an animal which shows a local reaction or one which does not. They found no evidence of any process or cycle of development from the metacyclic to the blood forms other than the direct conversion of the former to the latter and their subsequent multiplication by binary fission.—W.A.P.

GODFREY, D. G. (1958). **Influence of dietary cod liver oil upon** *Trypanosoma congolense, T. cruzi, T. vivax* **and** *T. brucei*. — *Exp. Parasit.* **7,** 255-268. [Author's summary modified.] **3195**

T. congolense multiplied more slowly in mice given a diet composed of casein, sucrose, dried yeast, salts, margarine and cod–liver oil than in mice given a normal diet. This agrees with the report of Keppie [see *V.B.* **24,** 1057], except that a high degree of suppression was not observed in the present work. Cod–liver oil given in diets adequate in water-soluble vitamins suppressed the multiplication of *T. congolense* and vitamin E reversed this effect. A diet containing 5% cod-liver oil suppressed *T. vivax* and the suppression was completely reversed by vitamin E. This diet did not suppress *T. cruzi,* and probably did not suppress *T. brucei.*

SHERIFF, D. (1957). **Canine visceral leishmaniasis in foxhounds near Baghdad.**—*Trans. R. Soc. trop. Med. Hyg.* **51,** 467. **3196**

S. reported that visceral leishmaniasis had been established in a pack of foxhounds near Baghdad. In the past attempts to find the infection in dogs in Iraq had been unsuccessful; kala azar occurs in man. Cutaneous leishmaniasis occurs in dogs in Iraq and a number of those examined for the visceral form with negative results by earlier authors were probably affected by the cutaneous form.—W.A.P.

SIMITCH, T., PÉTROVITCH, Z., BORDJOCHKI, A. & POP-CÉNITCH, S. (1957). L'évolution du kala-azar chez les chiens infectés expérimentalement par *Leishmania donovani.* [**Experimental infection of dogs with** *Leishmania donovani.*] — *Arch. Inst. Pasteur, Algér.* **35,** 372-381. **3197**

Results of examination of 137 dogs by means of smears of organs, the formol-gel test and inoculation of squirrels with organ suspensions indicated that in a region where human infection was endemic, there were dogs which harboured only small numbers of leishmania.

The course of experimental infection was studied in 42 dogs. Symptoms developed in 8 puppies and 16 adults; no symptoms were shown by the remainder. 7 of the puppies died within 1–7 days; the adults died within 72–837 days. Interpretation of results of the formol-gel test and of sternal marrow smears was discussed. —R.M.

SERRA, A. & CORRIAS, A. (1958). Diagnosi e trattamento delia tricomoniasi nel toro. [**Diagnosis and treatment of trichomonas infection in bulls.**]—*Vet. ital.* **9,** 267-282. [Summaries in English, French and German.] **3198**

Diagnosis and treatment of trichomonas infection in bulls are discussed. Successful results were obtained by irrigation of the prepuce with 1:1000 $AgNO_3$ soln. followed by lavage of the penis with 1:1000 trypaflavine and intraurethral injection of 30 ml. trypaflavine 1:1000 soln. and local application of "Bovoflavin" ointment.—T.E.G.R.

KARASSZON, D. (1957). Adatok a sertések fertőző gyomor-bélgyulladásának kóroktanához. **[Aetiology of porcine gastro-enteritis.]** —*Mag. állator. Lapja* **12,** 215-218. [In Hungarian. Summaries in English and Russian.] **3199**

Trichomonas suis was demonstrated from the mucosa of the colon of 288 young weaned, occasionally unweaned, piglets amongst 367 pigs which died from porcine gastro-enteritis. Methods of demonstration, isolation and identification, and description of these parasites were given. K. considered that the presence of these parasites in such a large proportion of cases might indicate their role in the aetiology of this disease, in the same way as in the pathologically similar disease, *Trichomonas gallinae* infection of turkeys.—A. SEBESTENY.

SEMELLINI, L. (1957). Controllo chemioterapico della coccidiosi epatica ed intestinale del coniglio nei piccoli allevamenti a carattere familiare. **[Chemotherapy of hepatic and intestinal coccidiosis in rabbits.]**—*Nuova Vet.* **33,** 273-280. [Summaries in English, German and Spanish.] **3200**

After a description of the various clinical forms of coccidiosis S. describes the treatment of the hepatic and intestinal forms in 25 outbreaks of which 11 (222 animals) were of the intestinal, 6 (160 animals) of the hepatic and 8 (210 animals) of the mixed type. The intestinal form was treated with sulphaquinoxaline sodium 0·0344% in the drinking water, and for the hepatic and mixed forms 0·3 g./kg. of hexachloroethane was added to the food once on the 15th and once more on the 31st day of such treatment. Treatment was uniformly successful (clinical cure). All the animals including their progeny, however, remained carriers of coccidia thus providing evidence of a state of premunition arising after treatment.

—G. P. MARSHALL.

BARNETT, S. F. (1957). **Theileriasis control.**—*Bull. epiz. Dis. Afr.* **5,** 343-357. [Summary in French pp. 391-392.] **3201**

An account of the author's experience of *Th. parva* infection of cattle in Kenya, including an account of experimental infection of zebu cattle with *Th. parva*. Attempts to attenuate the parasite by passage through unusual tick or mammalian hosts have failed, with the possible exception of passage through *Hyalomma dromedarii*, which was still being studied.

—R.M.

NEWBERNE, J. W., ROBINSON, V. B. & BOWEN, N. E. (1958). **Histological aspects of *Klossiella equi* in the kidney of a zebra.**—*Amer. J. vet. Res.* **19,** 304-307. **3202**

The P.M. findings in a zebra which died six months after arrival in the U.S.A. from Africa are described. There was no specific gross evidence of any morbid condition other than slight gastro-enteritis. The kidneys were heavily parasitized by *Klossiella equi* and the pathology and development of the parasites are described and illustrated.—R. N. FIENNES.

See also absts. **3458** (report, Gt. Britain); **3460** (report, Nyasaland).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

MOOSBRUGGER, G. A. (1958). Observations sur l'apparition de la fièvre aphteuse sur des animaux vaccinés la semaine précédente. **[Occurence of foot and mouth disease in cattle one week after vaccination.]**—*Bull. Off. int. Epiz.* **49,** 122-127. **3203**

The occurrence of F. & M. disease in vaccinated animals (8-10 days after vaccination) was attributed to a temporary post-vaccinal hypersensitivity.—T.E.G.R.

MOOSBRUGGER, G. A. & SPUHLER, V. (1958). Les variations de type du virus aphteux. **[Variation in foot and mouth disease virus.]** —*Bull. Off. int. Epiz.* **49,** 128-142. **3204**

Type mutation of the F. & M. disease virus is discussed and personal observations are recorded. Mutant types appeared in the epizootic of May–June 1956 in Switzerland and in other epizootics between 1952 and 1957. To date this phenomenon has been recorded in the case of Types O and A in the field and Type C both in the field and in the laboratory.—T.E.G.R.

KOBUSIEWICZ, T. (1958). Vaccination anti-aphteuse dans un foyer contaminé. **[Foot and mouth disease immunization in an infected area.]**—*Bull. Off. int. Epiz.* **49,** 153-156. **3205**

In an outbreak of F. & M. disease animals showing symptoms were slaughtered and the

others on the same premises were treated with a double dose of the Type O vaccine. There was no further incidence of disease up to the time of reporting—five months after vaccination.
—T.E.G.R.

BELIN, C. (1958). Application du vaccin anti-aphteux Belin, en France, au cours de l'épizootie de fièvre aphteuse 1956-1957. [**Use of the Belin vaccine in the 1956-1957 outbreak of foot and mouth disease.**]—*Bull. Off. int. Epiz.* **49,** 157-159. **3206**

The vaccine was used for compulsory and voluntary immunization, over 1,500,000 cattle being vaccinated. Vaccine production is continually increasing. Nevertheless it falls short of requirements which vary considerably from time to time. It is envisaged, however, that extension of the production programme will make good this shortage. It is stated that by this method of preparation by growing the virus *in vivo* it is only possible to vaccinate valuable livestock; 25,000 cattle would be required for the production of vaccine for the cattle population (17 million) of France.—T.E.G.R.

KORN, G. (1957). Experimentelle Untersuchungen zum Virusnachweis im Inkubationsstadium der Maul- und Klauenseuche und zu ihrer Pathogenese. [**Isolation of virus during the incubation period of foot and mouth disease.**] — *Arch. exp. VetMed.* **11,** 637-649. **3207**

Mucous membrane was taken from muzzle, nose, palate, cheek and trachea of 23 cattle slaughtered during the incubation period of F. & M. disease after application of the virus by various means to the muzzle or mouth. Virus was isolated from 7 of 41 samples of oral mucous membrane, and 24 of 51 samples from the other parts. No aphthae were found even by microscopic examination of mouth and tongue. It was concluded that primary multiplication of the virus after nasal or oral infection occurred in the upper respiratory tract, principally in the nasal mucous membrane. Virus entered the blood, apparently by way of the lymphatic system, before the onset of fever. In general there was no primary aphtha in natural infection.—R.M.

WEHMEYER, P. (1957). **Experiments on the activating and protective effects of some organic substances on foot-and-mouth disease virus.**—*Acta path. microbiol. scand.* **42,** 51-55. [In English. Author's summary modified.] **3208**

Cysteine, methionine, thyroxin, peptone and gelatin increased the antigenicity of F. & M. disease virus. Glycocol, leucine, valine and polysaccharides had the same effect, but also had a protective effect on antigenicity during inactivation. Glucose and extract of tongue epithelium had less protective effect during heat-inactivation of the virus. Some substances had no demonstrable effect; and serum proteins had a neutralizing effect on the virus.

BACHRACH, H. L. & BREESE, S. S., JR. (1958). **Purification and electron microscopy of foot-and-mouth disease virus.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 659-665. [Authors' summary modified.] **3209**

F. & M. disease virus, type A, from bovine-kidney tissue cultures was purified successively by methanol precipitation, extraction with organic solvents, and differential centrifugation. The virus particle in the resulting purified virus concentrates was identified by analytical electron microscopy in air-dried specimens as a uniform-sized 22-mμ particle. This identification was made through correlative experiments relating particle counts to infectivity and to aggregation of the particles with antiviral bovine serum. While an average of 690 virus particles was present in one plaque-forming unit for bovine-kidney monolayer cultures, a value as low as 33 was obtained.

MACKOWIAK, C. & LANG, R. (1958). Emploi des cultures de tissu dans le titrage du virus aphteux et la recherche des anticorps. [**Titration of foot and mouth disease virus by tissue culture methods.**]—*Bull. Off. int. Epiz.* **49,** 99-105. **3210**

The virus was grown on trypsinized porcine kidney and titrated simultaneously on young mice and on tissue culture. Results of titration on mice and on tissue culture were parallel. There was a slight difference in values of sucessive titrations of the same virus on tissue culture. It is considered that this method is sensitive and gives constant results; it is quicker than titration on mice; and it is more accurate as a large number of tubes can be used for each titration. For the titration of antibody the serum neutralization test gave satisfactory results.—T.E.G.R.

DINTER, Z. & WESSLÉN, T. (1958). Etude sur la production et le contrôle du vaccin anti-aphteux préparé selon la technique des cultures de tissus. [**Tissue-culture vaccines for foot and mouth disease.**] — *Bull. Off. int. Epiz.* **49,** 87-90. **3211**

The three European types of virus were

used in these studies, the viruses being grown on bovine tissue culture—epithelial cells of tongue mucosa, of embryo skin in plasma and of calf trypsinized kidney. Thirty-one strains were grown—8 Type O, 16 Type A and 7 Type C. Titration was based on cytopathogenicity, the specificity of which was confirmed by neutralization tests. In 10 of the strains cytopathogenicity was low, owing to interference by non-cytopathogenic elements which developed in culture; it was raised by passage in kidney cell culture. Corresponding titres were obtained on the three types of tissue and these agreed with those obtained in young mice. Titres were highest at 12-15 hours. Virus was inactivated with formol and aluminium hydroxide was added for the preparation of vaccines. Antibody production in cattle was tested by serum neutralization with kidney cell culture virus.—T.E.G.R.

I. VERGE, J., DHENNIN, LOUIS., DHENNIN LÉONE., PARAF, A. & LARENAUDIE, B. (1958). Recherches sur la vaccination intradermique en matière de fièvre aphteuse. [**Intradermal vaccination against foot and mouth disease.**] —*Bull. Off. int. Epiz.* **49,** 106-114. **3212**

II. VERGE, J., PARAF, A., DHENNIN, L., DHENNIN, L. & ASSO, J. (1958). Contribution à l'étude du mécanisme de l'immunisation chez les bovins vaccinés contre la fièvre aphteuse par voie intradermique. [**Intradermal immunization against foot and mouth disease.**]—*Ibid.* 115-121. **3213**

I. Results of three experiments, though encouraging, were inconclusive owing to the small number of cattle used. On the other hand valuable conclusions were drawn from the results of a test on 112 animals. It was observed that with the same vaccine s/c injection of a dose of 20 ml. gave better results than i/d injection of 3 ml. It was observed, however, that i/d vaccination with a small dose engendered a certain degree of immunity on the 4th and on the 8th day and it appeared that the immunity observed on the fourth day was the result of a non-specific reaction. It is proposed to carry out similar experiments to ascertain when immunity commences to develop by the s/c route, and also the duration of immunity by either route.

II. Tests on cattle led to the conclusions that: a small dose of vaccine by the i/d route conferred a weaker immunity than by the s/c route; immunity appeared to be effective from the eighth day; some degree of protection was established as early as the fourth day. The interference phenomenon, which occurs earlier with i/d than with s/c vaccination, is discussed. It is considered that it may be possible to combine the effects of both modes of vaccination (early protection and a solid longer immunity) by the simultaneous use of both routes.

—T.E.G.R.

WILLEMS, R. & LEUNEN, J. (1958). La vaccination anti-aphteuse trivalente. Sa nécessité—sa valeur—ses avantages—ses inconvénients. [**Trivalent foot and mouth disease vaccines.**] —*Bull. Off. int. Epiz.* **49,** 71-83. **3214**

The use of trivalent vaccines in the control of F. & M. disease is discussed. Immunity tests gave satisfactory results but it is not possible to draw general conclusions owing to the small number of animals used. Trivalent vaccine has been in use for four years in Belgium where it forms the basis of F. & M. disease control; in the 1957 epizootic it proved effective. Immunity is shorter in young animals and re-vaccination after six months would be indicated, though not always practicable. A trivalent vaccine is desirable in countries where all three types of virus may occur simultaneously. Among the disadvantages are the higher cost of production and the shorter immunity as compared with monovalent vaccines.—T.E.G.R.

GRIBANOV, V. (1958). Sur le problème des types du virus aphteux et de la prophylaxie spécifique de la fièvre aphteuse. [**Type variation and immunization against foot and mouth disease.**] — *Bull. Off. int. Epiz.* **49,** 143-152. **3215**

In the course of 2 years 172 strains of virus from various parts of the Soviet Union were examined. Of these 111 were Type A, 52 Type O and 9 Type C. Type A, recently introduced across the western border, was demonstrated in the central European area of the Union, where cattle were highly susceptible; it retained its type properties for several years, thus facilitating control by use of a monovalent vaccine. Types O and C occurred in the Republics of Central Asia and Kazakh, where they caused a fluctuating epizootic lasting many years. In this zone where the animals had a certain degree of immunity unstable variants of Type O were distinguished. These reverted to the standard type after passage in g.pigs. The appearance of these variants may be interpreted as an initial phase in the mutation of the virus in its natural environment. The serum neutralization test, supplemented with biological tests in new-born mice, was employed for the typing of virus strains. Sheep (in which the disease is mild and often inapparent) play an important role in the spread of infection in the Tadzhik Republic. Large scale studies were made of simultaneous

intradermal or submucous (in the upper lip) and subcutaneous vaccination. Attempts to adapt the virus to g.pigs and to new-born rabbits for vaccine production did not yield the desired results.—T.E.G.R.

CECCARELLI, A. & DEL MAZZA, I. (1958). Coltura del virus d'Aujeszky su cellule renali di agnello. **[Culture of Aujeszky's disease virus in lamb kidney cells.]** — *Zooprofilassi* **13,** 159-167. [Summaries in English and French.] **3216**

The virus of Aujeszky's disease was grown in monolayer cultures of trypsinized lamb kidney tissue for which it was pathogenic. Subsequent passages did not affect its pathogenicity for cells or for rabbits.—T.E.G.R.

HIDIROGLOU, M. (1958). Les vampires et la rage paralytique des bovidés en Guyane Française. **[Bats and paralytic rabies of cattle in French Guiana.]** — *Rec. Méd. vét.* **134,** 13-20. [Summary in English.] **3217**

In the course of investigation of high mortality among cattle in French Guiana it was observed that the cowsheds housing the animals were heavily infested with blood-lapping bats —*Desmodus rotundus, Diphylla caudata,* and *Diaemus young*. Biological tests with bat brain revealed paralytic rabies infection which was also diagnosed by lab. examination of brain tissue from affected cattle. It is concluded that the disease was transmitted to the cattle by bats. Control measures (extermination of bats and immunization of cattle) are discussed.

—T.E.G.R.

FALKE, D. & UHLMANN, W. (1957). Zur Frage der serologischen Tollwutdiagnose mit Hilfe des Komplementbindungs-Testes. **[Diagnosis of rabies with the aid of the complement-fixation test.]**—*Mh. Tierheilk.* **9,** 243-254. **3218**

Suitability of the c.f. test as a diagnostic aid in rabies was tested in experimentally infected small laboratory animals. Antigen for routine examinations was prepared from brain material suspensions centrifuged at 3000 r.p.m. for 30 min. Ammonium sulphate preciptation produced an increase in the titre without loss of antigenicity. This method was recommended for use when antigen content of brain tissue was too low to give a positive c.f. test. Details were given of the preparation of immune sera of relatively high titre. Negri bodies and infectivity were demonstrable during the incubation period in mice which had been infected intracerebrally and intramuscularly. For a positive c.f. reaction nearly 10^4 units of infectious virus were required. In various species of animals examined in a moribund state, all methods of examination yielded positive results. C.f. antigen was demonstrated in the brain of two foxes and one deer. It was concluded that successful demonstration of c.f. antigens depended on the virus titre, but the presence of Negri bodies appeared to depend more on the quality than the quantity of the circulating virus. A positive c.f. test, it was stated, was indicative of rabies whereas a negative one did not necessarily exclude the infection. [See also *V.B.* **28,** 1415.]

—E.G.

VILLEMOT, J.-M. & PROVOST, A. (1958). Précipitation spécifique du virus rabique en milieu gélifié selon la méthode d'Oudin-Ouchterlony (technique de Mansi). **[Specific precipitation of rabies virus in agar gel.]** — *C. R. Acad. Sci., Paris* **246,** 2694-2695. **3219**

The technique described by Mansi [*V.B.* **28,** 445] was applied to rabies virus. Two specific lines of precipitation were observed.—R.M.

MAQSOOD, M. (1958). **Generalised buffalo-pox.** —*Vet. Rec.* **70,** 321-322. **3220**

Since 1944, buffalo pox, a comparatively benign contagious disease usually localized on the teats and udder, has been observed in a generalized form in different parts of the Punjab region, West Pakistan. Cases uncomplicated by mastitis or indolent ulcers took 2–3 weeks to recover. Cases of generalized buffalo pox are often associated with outbreaks of smallpox.

—A. ACKROYD.

RAFELSON, M. E., JR. & ARNOFF, H. (1958). **Studies on the metabolism of virus-infected tissues. I. Free amino acid metabolism in chick chorioallantoic membranes infected with influenza virus.** — *Arch. Biochem.* **75,** 163-170. **3221**

The propagation of influenza type A virus in isolated chorioallantoic membranes was associated with increased metabolic activity of the free amino-acids in the host tissue; it did not affect the metabolism of protein-bound amino-acids.—R.M.

BROWN, L. V. (1958). **Studies on Western equine encephalomyelitis virus in tissue cultures. I. The color change of phenol red in cultures of chick-embryo tissue as a visible method for assay of Western equine encephalomyelitis virus and its antibody.**—*Amer. J. Hyg.* **67,** 214-236. [Author's summary modified.] **3222**

Phenol red was used as the indicator for

WEE virus activity in tissue-culture system composed of trypsin-dispersed chick-embryo tissue. Efforts to adapt the colour test to 2 other "arthropod-borne" viruses, Ilhéus and West Nile viruses, were described. The phenomenon of partial cytopathic effect, *i.e.*, incomplete destruction of the tissue-culture monolayer, was exhibited to some degree by all 3 viruses, being only slight in the case of WEE virus, but more extensive with Iléus and West Nile viruses. This phenomenon is stressed because of its role in the success or failure of the colour test. A future report will deal more fully with observations on this aspect of the behaviour of WEE virus in other cell systems.

PARKS, J. J. & PRICE, W. H. (1958). **Studies on immunologic overlap among certain arthropod-borne viruses. I. Cross-protection relationships among group A viruses.**—*Amer. J. Hyg.* **67**, 187-206. [Authors' summary modified.] **3223**

Tests *in vitro* with hyperimmune sera prepared in g.pigs revealed a reciprocal cross-neutralizing relationship between Sindbis and Western equine encephalomyelitis viruses. Chickens or hamsters infected with single s/c injections of Sindbis virus, within the quantitative range believed transmitted by mosquitoes, were protected against s/c challenge with WEE virus. Similarly, such animals infected with WEE virus were protected against challenge with Sindbis virus. All strains of Sindbis virus, whether isolates from Africa or India, showed a similar reciprocal cross-protective relationship with WEE virus. Protection against challenge with WEE virus was observed in chickens infected with Sindbis virus in which no cross-neutralizing antibody against WEE virus was demonstrated at the time of challenge. Cross-neutralizing antibody was demonstrated in chickens for periods of up to 8 months. Chickens previously infected with Sindbis virus responded with high levels of WEE neutralizing antibodies when given one injection of killed WEE vaccine. Control birds with no previous Sindbis infection developed little or no detectable WEE neutralizing antibody when given the vaccine. Chickens 1 to 3 months old circulated WEE virus (second mouse-brain passage) between 18 to 72 hours after infection. The infectious dose for 50% of the 79-day-old chickens was about one chick LD_{50}. The peak of the viraemia was reached within 36 hours and threshold quantities of antibody could be detected shortly after the termination of the viraemia. Intracerebral passage in unweaned mice decreased the pathogenicity of Sindbis virus, strain AR-169, for 12-hour-old chicks. A single passage in chickens resulted in a pool of virus with a high lethal titre for chickens. Little difference was observed in the intracerebral titre in unweaned mice of the various mouse-brain and the chick-blood virus pools.

IHLENBURG, H. (1957). Zur Epidemiologie, Diagnose und Behandlung der Bornaschen Krankheit. [**Epidemiology, diagnosis and treatment of Borna disease.**]—*Arch. exp. VetMed.* **11**, 835-861. **3224**

When an apparently normal sheep, which was one of several kept in the same stable as infected horses was slaughtered non-purulent encephalitis typical of Borna disease was present in the brain. On another farm under the same conditions a sheep sometimes grated its teeth: it also had non-purulent encephalitis. Of 175 wild mice caught in infected stables, 7 showed nervous symptoms and non-purulent encephalitis was present in 30 but it was not possible to isolate the virus and the author concluded that mice were probably of no importance in the spread of Borna disease.

The same type of encephalitis, apparently not caused by Newcastle disease or fowl paralysis, was found in 11 of 80 fowls from infected farms: attempts to isolate Borna disease virus were being made.

Experiments on rabbits indicated that intrauterine infection of foals was very improbable. Diagnosis remained a problem. Different methods of inactivation of serum for the c.f. test had not yielded satisfactory results.—R.M.

ULBRICH, F. (1958). Untersuchungen über die von Altara, Serra und Guarini modifizierte Komplementbindungsreaktion zur Diagnose der infektiösen Anämie der Einhufer. [**Studies on the modified complement-fixation test of Alrara, Serra and Guarini in the diagnosis of equine infectious anaemia.**]—*Zbl. VetMed.* **5**, 245-264. [Summaries in English, French and Spanish. English summary modified.] **3225**

This test is considered to be analogous to the classical Wassermann test. Alcoholic extracts of the organs of horses with infectious anaemia as well as extracts of organs of healthy horses or of other animals give in principle antigens of equal value. The best antigen was found to be one marketed under the name of "Cardiolipin". In interpreting the reaction account must be taken of the following rules. A negative reaction does not exclude infectious anaemia. A positive reaction may indicate infectious anaemia if the same positive result is obtained when the test is repeated with other

serum samples and when other diseases which may cause non-specific reactions have been excluded. Such non-specific reactions were demonstrated in 10 out of 13 horses used to produce swine erysipelas serum, in 2 horses with salmonellosis, in a horse with glanders and in a horse suffering from severe strongylosis. In all these cases infectious anaemia could be excluded with certainty. The diagnostic value of the test is slight, but it could be used with other methods.

RAMPTON, C. S., EVANS, S. A. & SCOTT, G. R. (1958). **The production of lapinised rinderpest vaccine.**—*Bull. epiz. Dis. Afr.* **6,** 23-36. [In French pp. 71-76.] **3226**

In the production of lapinized rinderpest vaccine at Muguga, Kenya, two completely separate units are used, one for vaccine production and housing of the rabbits and the other for handling of virulent rinderpest virus. The vaccine, which is a live substain of the Nakamura III strain attenuated by hundreds of serial passages in rabbits, is produced by inoculating rabbits with 1 ml. of lapinized virus containing 10,000 rabbit $I.D._{50}$ virus. After 48 hours, the rabbits are exsanguinated and the spleens and mesenteric lymph nodes of extensively infected animals homogenized with 3 times the volume of citrated blood and 200,000 units of penicillin. The mixture is then run through an Eppenbach colloid mill, centrifugally freeze-dried in ampoules for 10 hours, put in a vacuum desiccator overnight, and then dried in a secondary drying manifold before sealing under vacuum. Each batch is tested biologically in g.pigs, for its rabbit $I.D._{50}$ titre and in 8 cattle which are challenged with virulent virus 3 weeks after vaccination. To be accepted 7 of the 8 animals must give no reaction. To date 2½ million doses of vaccine (of the 3 million produced) have been passed for issue.—A. ACKROYD.

SCHWARZ, A. J. F., ZIRBEL, L. W., ESTELA, L. A. & YORK, C. J. (1958). **Propagation and modification of infectious bovine rhinotracheitis (IBR) virus in porcine kidney tissue culture.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 680-683. [Authors' summary modified.] **3227**

Infectious bovine rhinotracheitis virus was isolated in porcine kidney tissue culture from infected respiratory tissues of cattle, and produced a typical cytopathogenic effect on these cells. The virus was maintained for 10 passages and when inoculated intranasally into susceptible cattle, produced the characteristic signs of the disease. Virus after 7 passages in bovine kidney tissue culture was successfully propagated in porcine kidney tissue culture in 2 separate attempts, and was passaged 60 times (P-60) and 100 times (RP-100), respectively, in porcine kidney tissue culture. Inoculation of P-60 and RP-100 did not cause disease when inoculated either intranasally or intramuscularly into susceptible animals. Intramuscular inoculation of these viruses resulted in a specific antibody response.

VARACCA, D. W. (1958). Vaccinazione antiaftosa. Fattore scatenante l'influenza bovina. **[Bovine influenza precipitated by foot and mouth disease vaccination.]**—*Nuova Vet.* **34,** 60-64. [Summaries in English, German and Spanish.] **3228**

Clinical manifestations of "influenza" (dulness, congested mucous membranes, variable temperature, cough, inappetence, decreased milk yield and, in some cases, diarrhoea) appeared in a herd of 27 cattle 36 hours after vaccination against F. & M. disease. There was no evidence of any possible source of infection and the hypothesis is, therefore, put forward that the disease was in a latent form and was precipitated by vaccination.—T.E.G.R.

PRITCHARD, W. R., CLAFLIN, R. M., GUSTAFSON, D. P. & RISTIC, M. (1958). **An infectious ulcerative stomatitis of cattle.**—*J. Amer. vet. med. Ass.* **132,** 273-278. **3229**

A clinico-pathological description of a disease seen in several herds of cattle in Indiana. Attempts at experimental transmission were successful and the causal virus was demonstrated by the electron microscope to have a particle size of form 125 to 150 mμ. Points of similarity to other types of stomatitis and to the stomatitis of mucosal disease and virus diarrhoea are discussed. The disease most closely resembles the stomatitis described by Gibbons, W. J. (1956) —*Diseases of Cattle.* American Veterinary Publications, Inc., Evanston, Ill.—and there are unpublished reports of a clinically similar disease in New York State and Pennsylvania.

—L. M. MARKSON.

CAMPANO. (1957). Rapport sur l'épizootie de fièvre catarrhale ovine "langue bleue" en Espagne. **[Bluetongue in Spain.]**—*Bull. Off. int. Epiz.* **48,** 605-611. **3230**

C. described the course of the bluetongue epidemic in Spain which lasted from August to November 1956. Generally between 60 and 80% of affected sheep died and losses amounted to 132,000 sheep and 9 cattle. A tetravalent vaccine was produced and between September and November 7·8 million sheep and 50,000 cattle

were inoculated. It was intended to vaccinate all 20 million sheep in Spain.—R.M.

KOKERNOT, R. H., PATERSON, H. E. & DE MEILLON, B. (1958). **Studies on the transmission of Wesselsbron virus by** *Aedes* (*Ochlerotatus*) *caballus* **(Theo.).** — *S. Afr. med. J.* **32,** 546-549. [Authors' summary.] **3231**

Laboratory-reared *Aedes caballus* were allowed to engorge on a lamb infected with Wesselsbron virus.

On the 21st and 22nd post-engorgement days these mosquitoes transmitted the virus by bite to new-born mice.

134 wild-caught *Aedes caballus* were allowed to bite 31 new-born mice. A successful transmission resulted and Wesselsbron virus was confirmed in one mouse.

HEYMANN, C. S., KOKERNOT, R. H. & DE MEILLON, B. (1958). **Wesselsbron virus infections in man.** — *S. Afr. med. J.* **32,** 543-545. **3232**

Clinical Wesselsbron-virus infection in two men was described. Both were engaged in catching mosquitoes during an investigation of an outbreak of the disease among sheep. The diagnosis was confirmed by virus isolation in one case and by significant increase in titres of neutralizing antibodies in both cases. Epidemiological factors are discussed which might assist the practitioner in making a clinical diagnosis.

—R.M.

BEER, J. (1958). Untersuchungen an und mit komplementbindenden Antigenen des Virusaborts der Schafe. **[Studies on the complement-fixing antigens of virus abortion of sheep.]**—*Zbl. VetMed.* **5,** 305-328. [Summaries in English, French and Spanish. English summary modified.] **3233**

Highly effective antigens for complement fixation were obtained from the cotyledons and floccular exudate on the membranes of a sheep foetus aborted in a natural case of virus abortion. The production of antigen from the yolk sac membrane of infected chick embryos, on the other hand, was neither satisfactory nor economic. Boiling the antigens greatly increased their effectiveness. Attempts to purify antigens with ether, chloroform and trypsin damaged them.

Cross reaction with virus abortion antigen and sera as well as with psittacosis antigen and sera gave similar results. In a sheep infected with virus abortion fully positive titres were obtained up to 1:640. In naturally infected sheep fully positive reactions over 1:10 are probably significant. In general the titres lay between 1:20 and 1:80. In flock tests a single tube with a serum dilution of 1:20 or two tubes with 1:10 or 1:40 sufficed for each blood sample.

Pigeon sera from flocks suspected of psittacosis gave positive titres from 1:40 to 1:320. The sera of an owner of pigeons and his wife reacted fully at titres of 1:5 and 1:10 respectively. In a herd of cattle with unexplained abortions fully positive titres up to 1:20 were found.

The sera of all the persons occupied with these tests did not contain any antibodies demonstrable by complement fixation so that the preparation of antigens to the sheep abortion virus can be considered relatively harmless.

MITSCHERLICH, E. & LIESS, B. (1957). Chemotherapie des Virusabortes des Schafes. **[Chemotherapy of virus abortion in sheep.]** —*Rindertuberkulose* **6,** 75-91. **3234**

Against ovine abortion virus in chick embryos tetracycline and oxytetracycline proved about equally effective, while chlortetracycline was ten times less active and penicillin and "Solu-supronal" even less.

Field trials in infected ewes-in-lamb showed the i/m use of 350 mg./day of tetracycline and oxytetracycline to be effective, while procaine-penicillin ½ megaunit per day, and "Solu-supronal" 5 ml. per day, for 2 and 4 days, respectively, proved inactive. Daily oral doses of up to 15 g. of tetracycline and chlortetracycline, for 2 days, were well tolerated but proved ineffective (inadequate blood concentrations).

Considerations of cost led the authors to conclude that these preparations do not solve the problem of the chemotherapy of virus abortion in sheep.—G. P. MARSHALL.

MATTHIAS, D. (1957). Die Ausscheidung von neutralen 17-Ketosteroiden im Harn gesunder und pestkranker Schweine. **[Excretion of neutral ketosteroids in the urine of normal pigs and pigs with swine fever.]**—*Arch. exp. VetMed.* **11,** 959-975. **3235**

Soon after infection with swine fever the concentration of ketosteroids in the urine increased and remained high throughout infection, reaching a peak shortly before death. This finding indicated activation of the adrenal cortex in swine fever and it thus confirmed morphological evidence for adrenal insufficiency during swine fever.—R.M.

JANOWSKI, H., STRYSZAK, A. & MIERZEJEWSKA, M. (1958). Wstępne wyniki prób użycia

adaptowanego do królików (lapinizowanego) szczepu wirusa pomoru świń do profilaktycznych szczepień przeciw pomorowi świń. **[Prophylactic vaccination against swine fever with lapinized virus.]**—*Méd. vét., Varsovie* **14,** 129-134. [In Polish. Summaries in English and Russian.] **3236**

In preliminary laboratory and field tests the authors found, 3-7 days after vaccination, elevation of temperature, a fall in the number of w.b.c. and sometimes dullness and diarrhoea, especially in young pigs in poor condition. These reactions in some instances occurred in up to 30% of vaccinated animals but administration of swine fever serum could reduce the incidence to 2%. Vaccinated pigs excreted virus which however appeared to be harmless to susceptible pigs. Eight days after vaccination the pigs could withstand a challenge of 100,000 M.L.D.; the immunity lasts at least 6 months.

—M. Gitter.

Klotz, J. (1958). Über den Wert der Riemser Kristall-Violett-Vakzine bei der Bekämpfung und Tilgung der Schweinepest. **[Value of crystal violet vaccine (Riems) in the control of swine fever.]** — *Mh. VetMed.* **13,** 165-168. **3237**

Swine fever in 3 heavily infected districts was controlled by a s/c injection, followed by a second injection 14 days later, of 5 ml. of crystal violet vaccine in all pigs over 8 weeks old, in combination with strict hygienic measures. Deaths from vaccination were few—between 0·02% and 0·2% of the 127,000 pigs vaccinated. The disease was also controlled in a fourth district although, owing to a shortage of vaccine, only 30% of the pigs were vaccinated.

—M.G.G.

Hecke, F. (1958). Die Gewinnung von spezifischen Antiseren gegen das Virus der Ansteckenden Schweinelähmung (Teschener Krankheit) von Kaninchen. **[Preparation in rabbits of specific antisera against Teschen disease.]** —*Zbl. VetMed.* **5,** 129-134. [Summaries in English, French and Spanish. English summary.] **3238**

Tissue cultures of pig kidney prepared with pure saline or Tyrode's solution as medium were used for the cultivation of the virus of Teschen disease to a high titre. Rabbits were hyperimmunised with the material, which was poor in non-specific antigens and was mixed with an equal amount of aluminium hydroxide. These rabbit sera proved to be strongly specific in neutralisation tests and were at least as effective as potent neutralising sera from pigs.

Hopkins, S. R. (1958). **The growth and cytopathogenicity of vesicular exanthema virus in swine kidney tissue culture.**—*Amer. J. vet. Res.* **19,** 497-499. [Author's summary modified.] **3239**

Pig kidney cells in tissue culture are capable of supporting the growth of vesicular exanthema virus type B_{51}. In addition, the virus has a cytopathogenic effect on pig kidney cells which leads to their destruction. This cytopathogenic effect was used as the indicator of virus growth in an *in vitro* neutralization test. An early appearance of neutralizing antibody was demonstrated which could possibly be applied to the diagnosis of vesicular exanthema.

Goodwin, R. F. W. & Jennings, A. R. (1958). **A highly infectious gastro-enteritis of pigs.**—*Vet. Rec.* **70,** 271-272. [Authors' summary modified.] **3240**

An account is given of a highly infectious gastro-enteritis of pigs that appears to be identical with the transmissible gastro-enteritis described in the U.S.A. [*V.B.* **17,** 1137]. [See also *V.B.* **28,** 2161.]

Fujimoto, Y. (1957). **Studies on infectious canine hepatitis. III. Studies on the intranuclear inclusion bodies.**—*Jap. J. vet. Res.* **5,** 167-176. [Author's summary modified.] **3241**

F. investigated histopathology and cytochemistry of the nuclear inclusions. The inclusions were either granular or homogeneous. It was believed that the former develop into the latter. From the distribution of the inclusions, F. believed that the virus is pantropic. The inclusion bodies were free from carbohydrate, fat, inorganic iron and crystals, and consisted chiefly of nucleic acids.

Ferreira Neto, J. M. & Figueiredo, J. B. (1957). Tratamento da papilomatose dos cães pela injeção intramuscular de solução de urotropina a 40%. **[Intramuscular injection of urotropine in treatment of papillomata in dogs.]**—*Arch. Esc. Vet. Minas Gerais* **5,** 315-319. [In Portuguese. Summary in English.] **3242**

Hexamine (urotropine) was administered intramuscularly as a 40% soln. at 1 ml./kg. body wt. 24 dogs with papillomatosis were treated, 18 of them with a single dose and the remainder with 2, 3 or 4 doses. In 17 cases the papillomas had disappeared 8–10 days after treatment; in the remainder they disappeared between 15 and 60 days after treatment (one case failed to respond).—R.M.

JACOTOT, H., VALLÉE, A. & VIRAT, B. (1958). Étude expérimentale du neuromyxome. **[Experimental study of neuromyxoma.]**—*Ann. Inst. Pasteur* **94**, 549-559. [English summary modified.] **3243**

In wild and domestic rabbits bred in France, the symptomatology of neuromyxoma is characterized by a slight oculo-nasal catarrh and the formation, at the outer border of the ear, of very small dense and circumscribed nodules. The course of the disease can be severe and even fatal. The variations observed between different rabbits, or between different series of inoculations, might be due to the presence in the suspension of particles of unequal virulence, or to genetic variations in the rabbits' resistance, or to physiopathological alterations due to climatic variations, changes in diet, habitat, etc. Only a minority of the rabbits inoculated with neuromyxoma virus become fully immunized against the classical virus; most of them respond to the inoculation of this virus by the formation of a local oedema, followed by a scab; in a few animals, the infection becomes generalized. Neuromyxoma virus is not neurotropic and its behaviour in the rabbit is not very different from that of the attenuated viruses frequently isolated in the field. It is probably the most attenuated among mutants known to-day.

MITCHELL, C. A., NORDLAND, O. & WALKER, R. V. L. (1958). **Myxoviruses and their propagation in the mammary gland of ruminants.**—*Canad. J. comp. Med.* **22**, 154-156. [Summary in French.] **3244**

Previous studies [*V.B.* **23**, 2571, 3366; **25**, 1369; **26**, 3177] indicated that certain viruses could be propagated in the lactating mammary gland of ruminants, and those of influenza, Newcastle disease and fowl plague revealed a relatively high titre in milk.

Present attempts to propagate the virus of mumps, proved successful. Some variation in the behaviour of this virus from the others was noted, in that it was found in the blood for a few days, it failed to reach a high titre in milk and it remained longer in the gland.

RUEBNER, B. & BRAMHALL, J. (1958). **The effect of nutritional factors on experimental virus hepatitis in mice.**—*Amer. J. Path.* **34**, 570-571. [Authors' abst. modified.] **3245**

The virus used in the present experiments was $M.H.V._3$ which uniformly causes a fatal hepatitis in weanling mice. Mortality decreases with age and is approx. 30% at the age of 32 days in the strain of mice used. The virus material and the mice themselves were free from *Eperythrozoon coccoides* which greatly enhances the pathogenicity of the virus. In the first experiment the effect of choline deficiency was investigated. One group of 28 mice received the experimental diet. Another 29 mice were fed on a similar diet to which 0·5% choline had been added. After 11 days on their respective diets both groups were inoculated i/p with the virus. The number of deaths in the 2 groups was the same, and it was concluded that the fatty liver of choline deficiency was no more susceptible to virus hepatitis than the histologically normal liver.

In a second experiment the effect of one of the experimental diets (containing 50% lard, 16% casein, and 0·5% choline) was compared with that in animals normally fed. Two groups of 28 mice were used. The mortality of the mice on the experimental diet was 21 in 29 compared with 11 in 28 in the control group. It was concluded that deficiency of an unidentified dietary factor has an enhancing effect on virus hepatitis in mice.

WOKE, P. A. & ROSENBERGER, C. R., JR. (1957). **Survival of mouse poliomyelitis virus in living invertebrates.**—*J. infect. Dis.* **100**, 12-16. **3246**

In a search for an invertebrate that might serve as a culture vehicle for viruses, the virus of murine poliomyelitis (Theiler's encephalomyelitis) was inoculated into the haemocoele of several species. Maximum survival times were: 7 days in *Lymnaea stagnalis*, 14 days in *Biomphalaria glabratus*, 21 days in a cricket (*Acheta assimilis*), and 21–28 days in 3 species of conenose bug.—R.M.

BINDRICH, H. (1957). Beitrag zum Infektionsspektrum des Virus der atypischen Geflügelpest. **[The host range of Newcastle disease virus.]**—*Arch. exp. VetMed.* **11**, 717-740. **3247**

Three strains of the virus were used. Intracerebral inoculation of 2 of the strains resulted in nervous symptoms in piglets and specific antibodies were found in the serum. There was no cross-immunity to the virus of Teschen disease. Intracerebral or intramuscular infection of puppies was followed by fever, conjunctivitis and rhinitis but there were no nervous symptoms; antibodies were formed. No immunity developed to subsequent infection with distemper virus. Unweaned mice and g.pigs were susceptible to intracerebral infection with one of the strains of virus but not the other two.—R.M.

BANKOWSKI, R. A. (1958). **A tissue culture-modified Newcastle disease virus. I. Modifi-**

cation, propagation and characteristics of the tissue culture Newcastle disease virus.—*Avian Diseases* **2,** 197-209. [Author's summary modified.] **3248**

The California 1194 strain of NDV was attenuated by serial passage through Simm–Sanders medium containing fragments of chick embryo tissue and bovine serum ultrafiltrate. The attenuated virus did not produce signs of Newcastle disease in susceptible chickens when given i/m or i/v. The virus was highly pathogenic for chick embryos but did not regain its virulence for fowls after 50 serial passages through the susceptible host tissue. The virus propagated in chick embryo tissues or in monolayer cultures of HeLa cells induced a high immunogenic response.

SINHA, S. K. (1958). **Influence of temperature of incubation of embryonating eggs following inoculation of Newcastle disease virus.**—*Avian Diseases* **2,** 138-147. [Author's summary modified.] **3249**

A significant difference of several hours in the death of embryonating eggs incubated for 10 days at 99° and 95°F. has been observed following inoculation of six strains of Newcastle disease virus by the allantoic route. The embryos died much earlier at 99°F. that at 95°.

Similiarly earlier embryonic death was observed at 99° than at 95° in 7, 10, and 12-day-old embryonating eggs following allantoic inoculation of Roakin strain of ND.V.

BURNSTEIN, T. & BANG, F. B. (1958). **Infection of the upper respiratory tract of the chick with a mild (vaccine) strain of Newcastle disease virus. I. Initiation and spread of the infection. II. Studies on the pathogenesis of the infection.**—*Bull. Johns Hopk. Hosp.* **102,** 127-134 & 135-157. **3250**

Infection of the nasal passages was established in young chicks by intranasal instillation of small volumes (0·02 ml.) of the B.1 strain of N.D.V. Virus was recovered from trachea and lungs of only a few of these chicks. If larger volumes of inoculum were used or if virus was given by aerosol inhalation infection also involved the lower respiratory tract. Spread of inoculum was studied by the use of India ink or normal allantoic fluids labelled with radioactive phosphorus. Infections contracted by contact or through drinking water were also mostly limited to the nasal tract.

When chicks were inoculated with NDV intranasally, there was an initial decrease in the amount of virus in the turbinates, then during 18–24 hours after infection it increased, maintaining a titre of up to 10^5 for 4 days and decreasing thereafter. It was found as late as 12 days in perfused material despite the appearance of antibodies. There were focal lesions in which the mucosa was ulcerated and replaced by inflammatory tissue. Infected cells were studied by electron microscopy: virus was not identified. By means of fluorescent antibody the virus was found in the same areas in which lesions were present. In birds in which much of the ciliated and mucous epithelia had changed to squamous epithelium as a result of vitamin A deficiency, virus infection was still limited to the nasal tract. —R.M.

GEHRING, K. (1958). Prüfung einer holländischen Trinkwasservakzine (Lebendvakzine) gegen die atypische Geflügelpest im Vergleich mit Adsorbatvakzine. **[Comparison of a drinking-water live vaccine against Newcastle disease with adsorbate vaccine.]**—*Mh. Tierheilk.* **10,** 55-66. **3251**

Chicks were vaccinated against Newcastle disease at 10 or 14 days of age with live vaccine given in the drinking water or with adsorbate vaccine injected i/m. They were infected i/m with a virulent strain after 18 days, or 6, 12, or 18 weeks. Of 72 chicks given live vaccine 4 died and 3 developed symptoms after experimental infection, whereas all the 71 chicks given adsorbate vaccine remained well. Ten serial passages of the vaccinal virus in incubated eggs increased its immunological power but rendered it pathogenic for 14-day-old chicks. On account of the possible pathogenicity of this vaccine and as it would hamper control measures in outbreaks of Newcastle disease, its use is not recommended.—M.G.G.

SEVOIAN, M., WINTERFIELD, R. W. & GOLDMAN, C. L. (1958). **Avian infectious hepatitis. I. Clinical and pathological manifestations.**—*Avian Diseases* **2,** 3-18. **3252**

WINTERFIELD, R. W., SEVOIAN, M. & GOLDMAN, C. L. (1958). **Avian infectious hepatitis. II. Some characteristics of the etiologic agent. Effect of various drugs on the course of the disease.**—*Ibid.* 19-39. **3253**

I. Symptoms described are reduced egg production and general debility leading, over a period of weeks, to as much as 15% mortality in severely affected flocks. Focal necrosis and sinusoidal haemorrhages were consistently present in the liver with, variably, hydropericardium, mononuclear cell infiltration in the epicardium and myocardium, decreased splenic lymphopoietic activity, and purulent nephritis.

The causal agent was lethal for chick embryos by the intravitelline and intra-allantoic routes. The disease was transmitted experimentally to chickens by intraperitoneal or intramuscular inoculation of yolk fluid from infected embryos. The susceptibility of the inoculated chickens decreased with age.

II. The agent filtered through 0·45μ Millipore membranes but did not pass 0·30μ membranes or Seitz EK pads. Bacterial cultures from infective yolk and affected livers were negative for known avian pathogens. Four strains of the organism were sensitive in different degrees to several antibiotic substances some of which also appeared to exert a prophylactic effect. Furazolidone was therapeutically highly effective. Neutralizing antibodies could not be demonstated in the serum of experimentally infected chickens, indeed recovered birds were susceptible to re-infection. Infection of day-old turkey poults and 4 to 5-week-old rabbits was achieved. Young mice and adult hamsters appeared to be refactory to infection. The viability of the organism at different temperatures was investigated.—L. M. MARKSON.

MOORE, R. W. (1958). **Studies of an agent causing hepatitis in chickens.**—*Avian Diseases* **2**, 39-54. **3254**

There are many points of similarity between this disease and its causal agent and the avian infectious hepatitis and its causal agent described by Sevoian *et al* [see above].
—L. M. MARKSON.

FÜRST, W., KOVAC, W. & MORITSCH, H. (1957). Enten als Virusreservoir für Ornithoseerkrankungen des Menschen. **[Ducks as a reservoir for ornithosis in man.]**—*Wien. klin. Wschr.* **69**, pp. 223-228. **3255**

Six workers on a duck farm developed pneumonia and their sera were positive for psittacosis. Three strains of the virus were isolated from liver and spleen of 8 young ducks which died [nature of illness not stated]. Histological examination of organs from the ducks revealed acute atrophic changes in the liver and enlargement of the spleen with foci of cell infiltration undergoing necrosis.—R.M.

ROGER, A. & ROGER, F. (1958). La phase rickettsienne des virus du groupe psittacose-lymphogranulomatose et son mécanisme de division. **[The rickettsial phase of viruses of the psittacosis-lymphogranuloma group and its mode of division.]**—*Ann. Inst. Pasteur* **94**, 667-669. [English summary modified.] **3256**

The division of ovine abortion virus is more complex during the rickettsial phase than during the elementary body phase. Division is always accompanied by bipartition of the polar granules of chromatin, which are Piekarski–Robinow positive.

GIROUD, P., COLAS-BELCOUR, J., PFISTER, R., DUMAS, N. & FIOCRE, B. (1958). Isolement chez *Ixodes ricinus* capturé en France sur bovin malade d'une souche néorickettsienne comparable à celles isolées sur l'animal ou sur l'homme. **[Isolation of a strain of "neorickettsia" from *Ixodes ricinus* in France.]**—*C. R. Acad. Sci. Paris* **246**, 2698-2700. **3257**

An agent isolated from a single *I. ricinus* collected from a cow with bronchopneumonia was immunologically similar to Strain X14 which has been previously isolated from African ticks. No antibodies to this strain were detected in serum from the cow. Nothing was isolated from other batches of *I. ricinus* or from *D. pictus*.—R.M.

See also absts. **3373** (diseases of c.n.s.); **3458** (report, Gt. Britain); **3459** (report, New Zealand); **3460** (report, Nyasaland); **3467** (book, Congress Proceedings).

IMMUNITY

GREIGER, W. B. & ALPERS, H. S. (1957). **Mode of action of antigen and other smooth-muscle stimulants.**—*Science* **125**, 1141. **3258**

Ilea of g.pigs actively sensitized to egg albumen were used in the Schultz–Dale test to investigate the mode of action of the following smooth-muscle stimulants, serotonin, nicotine, acetyl choline, barium chloride and histamine.

Contraction of muscle due to antigen, serotonin or nicotine, was prevented by low concentrations of alchohols or urethanes, probably by preventing conduction in nerves. Stimulation of the sensitized tissue by antigen and serotonin was prevented by the structural analogues of serotonin and it is suggested that antigen may act by liberating serotonin. From these and other tests a tentative description is offered of the possible sites of action of certain stimulants and their inhibitors.—W. E. PARISH.

TRAPANI, I. L., GARVEY, J. S. & CAMPBELL, D. H. (1958). **Stimulating action of soluble antigen-antibody complexes on normal guinea-pig smooth muscle.** — *Science* **127**, 700-701. **3259**

Soluble antigen–antibody complexes formed

by bovine serum albumin and the homologous rabbit antisera were tested on strips of normal g.pig ileum by the Schultz–Dale technique. Contractions were compared with those obtained by 5μg. of histamine. Principal activity was found in supernates of slight to moderate antigen excess, but was absent in tubes with antibody excess and weak with extreme antigen excess. Control tests with the reagents alone caused no contraction. A time lag of 30 to 90 sec. occurred from the time of addition of the test material and onset of contraction, therefore it was not a histamine type of response. But a second challenge to the washed muscle preparation gave no response, which is suggestive of an immune reaction.—W. E. Parish.

Gyenes, L., Rose, B. & Sehon, A. H. (1958). **Isolation of antibodies on antigen–polystyrene conjugates.** — *Nature, Lond.* **181**, 1465-1466. **3260**

An account of a method of obtaining specific antibodies from a serum with the minimum contamination by non-specific serum proteins. Protein antigens were coupled through stable azo bonds to a non-polar polystyrene to form an insoluble Styron–antigen conjugate. Several Styron–antigen complexes prepared with a variety of soluble antigens were used to remove precipitating antibodies from homologous rabbit antisera. Antibodies could be recovered from the insoluble Styron–antigen–antibody complexes by dissociation with hydrochloric acid and these antibodies retained their immological specificities. Antibodies were not removed from sera other than by the specific antigen complex.

Styron–ragweed conjugates were capable of removing completely skin-sensitizing and blocking antibodies from sera of ragweed-sensitive individuals. The reaction was specific for this antigen and is taken as evidence that firm combination does occur between these antibodies and the ragweed allergens.—W. E. Parish.

Ishizaka, K. & Campbell, D. H. (1958). **Biological activity of soluble antigen–antibody complexes. I. Skin reactive properties.** — *Proc. Soc. exp. Biol., N.Y.* **97**, 635-638. [Authors' summary modified.] **3261**

Immediate skin reactions were obtained in normal g.pigs by i/d injections of soluble antigen–antibody complexes, and also by injections of an electrophoretically separated component of serum from immunized or normal rabbits.

Chang, T. S. (1957). **The significance of the bursa of Fabricius of chickens in antibody production.**—*Dissertation, Ohio State Univ.* pp. 115. [Abst. from abst. in *Diss. Abstr.* **17**, p. 2117 (1957).] **3262**

Bursectomy at the age of 10 weeks had no effect on production of antibodies to *S. typhi-murium*, but when the operation was done at 2 weeks of age antibody production decreased. Although weight of the spleen increased 3 weeks after bursectomy, the spleen did not re-establish normal antibody production. A broth culture of *S. typhi-murium* caused 14% mortality in normal fowls aged 8 weeks, 28·5% mortality in spleenectomized fowls, 72·7% in bursectomized, and 100% in bursectomized-splenectomized birds.—R.M.

Glick, B. (1958). **Further evidence for the role of the bursa of Fabricius in antibody production.**—*Poult. Sci.* **37**, 240-241. **3263**

The bursa of Fabricius was removed from 24 pullets, 4 weeks old. A crude cell suspension of fresh bursa material was injected i/m at varying times into 12 of these birds divided into two groups of 6. Antibody formation was stimulated by the i/v injections of sheep r.b.c. into all these birds and 6 normal controls. It was found that the serum agglutinin titre to sheep r.b.c. was highest in the normal control birds, and higher in one of the bursectomized groups receiving injections of bursa extract than in the remaining groups. It is concluded that the bursa of Fabricius is an important site of antibody formation in the fowl.—W. E. Parish.

Cock, A. G. & Simonsen, M. (1958). **Immunological attack on newborn chickens by injected adult cells.** — *Immunology* **1**, 103-110. [Authors' summary modified.] **3264**

When blood from pure line I adult fowls is injected into newly hatched chicks of a cross between two highly inbred lines of White Leghorn (C and I lines) gross enlargement of the spleen and liver results. F_1 blood injected into F_1 chicks, and either I or F_1 blood injected into I chicks, produce only a relatively slight enlargement, which is attributable to antigenic diversity within the C line, and to a much lesser extent within the I line, already known to exist from skin grafting tests. This strongly supports the hypothesis that these symptoms, together with haemolytic anaemia and other associated symptoms described by Simonsen [*V.B.* **27**, 3308], are due to an immune reaction of the injected cells against the host. This implies that chicken leucocytes are capable of initiating antibody production and transplantation immunity. Subcutaneous injections of blood sometimes produce swellings at the site of injection. No symptoms were found in F_1 adults into which

I blood had been injected; the reason for this is not known.

BARDAWIL, W. A., TOY, B. L. & GALINS, N. (1958). **Hypersensitivity to histone induced experimentally in rabbits.**—*Lancet* April 26th, 888-889. [Authors' summary.] **3265**

The histochemical behaviour of sera from human patients with certain so-called collagen diseases has been simulated by samples from an animal sensitised against bovine histone.

Evidence is presented that the observed effect depends on immunological reaction, and the relation to human disease is discussed.

ANON. (1958). **Chimeras and antibodies.** — *Lancet* April 26th, 892-893. **3266**

Recent advances in certain rapidly growing fields of immunology are reviewed. The method is outlined whereby the irradiated animal in which the blood-forming tissues have been destroyed, may be protected by the subsequent intravenous injection of a suspension of bone-marrow cells. The more dissimilar the donor and the recipient the larger the dose of myeloid cells required and the shorter the subsequent survival time of the animal, since immunological intolerance may be developed by the host, or the foreign donor cells may respond immunologically to the tissues of the host.

At a recent symposium sponsored by the Oak Ridge Laboratory, Tennessee, large pyroninophilic cells derived from the primitive fixed reticular cell were implicated in the production of antibody, acting as possible precursors of small lymphocytes or mature plasma cells.

Antibodies appeared to be built up *de novo* from amino-acids which were to some extent organised into their proper sequence in the polypeptide chain by specific nucleic acids. However antibodies to the same antigen were not necessarily identical and could not be regarded as precisely constitued chemical compounds of reproducible properties.—A. E. PIERCE.

See also absts. **3085** (relationship between chemotherapy and immunity); **3108** (haemorrhagic septicaemia vaccine); **3114** (bactericidal substances in uterus); **3130** (milk agglutination tests for brucellosis); **3131** (c.f. test for brucellosis); **3133** (brucellosis in immunized cattle); **3134, 3136, 3137,** (brucellosis); **3143, 3144** (brucellosis in sheep); **3148** (Br. ovis vaccine); **3157** (slide agglutination test for leptospirosis); **3159** (passive transfer of immunity to tetanus); **3203, 3204, 3205, 3206, 3208, 3211-3214** (F. & M. disease); **3223** (arthropod-borne viruses); **3225** (c.f. test for E.I.A.); **3226** (lapinized rinderpest vaccine); **3228** (bovine influenza after F. & M. disease vaccination); **3233** (c.f. antigens in virus abortion); **3236** (lapinized swine fever vaccine); **3237** (crystal violet swine fever vaccine); **3239** (Teschen disease); **3250, 3251** (Newcastle disease); **3280** (strongyloides); **3282** (haemonchus); **3301** (neutralizing antibodies); **3373** vaccines affecting the c.n.s.); **3458** (report, Gt. Britain); **3459** (report, New Zealand); **3461** (report, Belgian Congo).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

GLESS, E. E. & RAUN, E. S. (1958). **Insecticidal control of the chicken body louse on range turkeys.**—*J. econ. Ent.* **51,** 229-232. [Authors' abst. modified.] **3267**

A crop sprayer was placed on the ground with the nozzles directed upward and slightly forward. Flocks of turkeys infested with *Eomenacanthus stramineus* were driven through a curtain of spray. A flock of about 2,600 turkeys could be treated in an hour. Malathion applied at 1% concentrations and at a pressure of 60 lb. per sq. inch killed 100% of lice within 24 hours. Flocks remained uninfested for 3 weeks. 0·5% malathion applied at a pressure of 40 lb. was only partially effective. 1% lindane killed 100% of lice within 24 hours when applied at a pressure of 60 lb. After 14 days the infestation had become re-established. 3% D.D.T. applied at a pressure of 60 lb. reduced the infestation but did not give complete control.

KNAPP, F. W., TERHAAR, C. J. & ROAN, C. C. (1958). **Field studies with feed and bolus formulations of Dow ET-57 for control of cattle grubs.**—*J. econ. Ent.* **51,** 119-122. **3268**

Dow E.T.-57 was administered in the autumn to 479 calves and yearlings infested with visible warbles. 235 were given boluses at the rate of 110 mg. of E.T.-57/kg. body wt., after which 118 animals (on one farm only) developed another 59 warbles whereas the 117 controls developed 1,292. On another farm 80 treated animals developed 30 new warbles and the untreated 84 controls, 269 warbles.

In a concurrent experiment on the second farm 80 animals received another formulation of the same drug mixed in concentrated meal and made up into pellets. This was fed to calves so that the average treatment rate was 110 mg./kg. for a 500 lb. calf consuming 2 lb. of meal. These 80 animals developed 20 new warbles.

Monthly weighing showed no significant difference between the controls and any of the treated animals. Cholinesterase determinations showed that by 4 days the drug produced a marked depression of enzyme activity in the bolus treated animals, which returned to normal by the 24th day. Enzyme activity was depressed further in the animals given the drug in the food. No clinical symptoms of toxicity were observed. —W. E. PARISH.

MARQUARDT, W. C. & HAWKINS, W. W., JR. (1958). **Experimental therapy of fly strike in sheep, using a systemic insecticide.**—*J. Amer. vet. med. Ass.* **132**, 429-432. [Authors' summary modified.] **3269**

Of 20 ewes and lambs treated for fly strike by oral administration of ET-57, 12 recovered within 48 hours, 3 made partial recoveries, 2 did not recover, and 3 either required longer than 48 hours for elimination of larvae, or were not observed until after more than 48 hours. Of 8 rams treated with both systemic and topical insecticides for head strike, only 1 failed to recover within 48 hours. Effective oral doses were 150 to 200 mg. per kg. body wt. Toxic effects were seen only in a lamb given 310 mg. per kg. body wt. Recovery was rapid when larvae had penetrated the skin. For superficial infestations, systemic treatment was of little value.

TIEN-HSI CHENG & VANDERBERG, J. P. (1958). **The treadle sprayer and the cable-type back rubber for control of biting flies on cattle in Pennsylvania.** — *J. econ. Ent.* **51**, 149-156. **3270**

A treadle sprayer using a 50% butoxy polypropylene glycol and 5% methoxychlor in methylated naphthalenes was employed daily for 21 days to protect 14 cattle from horn fly *Siphona* (*Lyperosia*) *irritans* and stable fly *Stomoxys calcitrans*. A comparison of daily fly counts made on treated and untreated animals at different times after spraying showed that there was 90% control of *Siphona* and 34·7% control of *Stomoxys*.

A cable type back rubber using the same formulation gave 52·5% to 99·7% protection from *Siphona* for 25 days but only 33% to 54·4% from *Stomoxys* for 15 days. The results varied with different types of environment.

In other tests using a back rubber both indoors and at pasture the protective properties of four formulations were tested, two as above, Lethane 384 and synergized pyrethrins. All gave good control of *Siphona* but not of *Stomoxys*.

—W. E. PARISH.

MACLENNAN, K. J. R. & KIRKBY, W. W. (1958). **The eradication of *Glossina morsitans submorsitans* Newst. in part of a river flood plain in Northern Nigeria by chemical means.** — *Bull. ent. Res.* **49**, 123-131. [Authors' summary modified.] **3271**

A focus of the fly, covering an area of seven square miles, in which the dry-season concentration sites, mainly forest islands, amounted to approx. 200 acres, was selected for an experiment. It was isolated from the main focus by a natural barrier five miles wide.

Possible eradication measures in this focus are mentioned and reasons given for adopting the application of a residual insecticide.

DDT, in the form of a 50% wettable powder as a 5% supension of actual DDT in water, was applied, during the second half of the dry season, at an estimated rate of 20 lb. per acre to the evergreen forest islands, which had previously had paths slashed around and through them. Pneumatic knapsack sprayers were used. A preliminary trial showed that, for up to six weeks after application of the insecticide, examples of *G. morsitans* from unsprayed forest, placed in contact with sprayed leaves and bark, died in three hours, controls remaining alive for 24 hours. It is suggested that this good persistence may be attributable to the fact that the treated surfaces were in the shade, and that the application was made during the rainless season and at a time when the vegetation was dormant. There was a rapid decline in the population of *G. morsitans* after spraying. The flies persisted longest (5 weeks) in a site associated with *Mitragyna inermis*. One application only was given to one part of the focus and in many others one application would probably have sufficed, the second being given in most instances to control *G. tachinoides*, which was also present, and only in two instances for the eradication of *G. morsitans* that persisted after the first application. One of these was the site associated with *Mitragyna inermis*, mentioned above. The last specimen of *G. morsitans* was caught five weeks after the first application, and none has been caught in the sprayed area for up to 18 months after spraying.

HEWITT, R., BREBBIA, A. & WALETZKY, E. (1958). **Carbamoyl alkyl phosphorodithioates as chemotherapeutic agents: screening by aedicidal properties in laboratory mammals, lambs and calves.**—*J. econ. Ent.* **51**, 126-131. [Authors' abst. modified.] **3272**

Procedures are given for the use of a mouse–mosquito (*Aedes aegypti*) test, and supplementary tests in other mammals, in screening and evaluating compounds for sytemic insecticidal activity. Nine of 13 known insecticides given orally to mice killed mosquitoes feeding on them, including 6 out of 7 compounds known to be effective against warbles. The most active of 19 carbamoyl alkyl phophorodithioates tested was O,O,-dimethyl-S-(N-methylcarbamoylmethyl) phosphorodithioate. This had an ED_{50} in mice, lambs and calves of about 6 mg./kg., the LD_{50} being about 140 mg./kg. for mice. In lambs

and calves, about 7 times the ED_{50} produced toxic symptoms. Structure–activity relationships in the carbamoyl alkyl phosphorodithioates indicated the superiority of O,O-dimethyl compounds over corresponding O, O,-diethyl analogues. The few higher O, O,-alkyls tested were uninteresting. In the O,O-dimethyl series, the unsubstituted carbamoyl group was less than one-twentieth as active as the methyl carbamoyl.

ABBOTT, D. C., JOHNSON, E. I. & POLHILL, R. D. A. (1958). **The determination of the γ-isomer of benzene hexachloride in sheep dips and similar formulations.**—*J. Sci. Fd Agric.* **9**, 308-312. [Authors' summary.] **3273**

Benzene hexachloride may be separated from mixtures with most other substances by treatment with fuming sulphuric acid on a kieselguhr column. A method employing this device for the determination of γ-isomer in complex formulations and a method of making the nitromethane-silica partition chromatographic column from readily available materials are described.

SNOWBALL, G. J. (1957). **Ecological observations on the cattle tick, *Boophilus microplus* (Canestrini).** — *Aust. J. agric. Res.* **8**, 394-413. **3274**

The duration of the non-parasitic stages in relation to tick incidence on cattle in Queensland was studied.

Females produced no progeny between April and July. This, combined with the dying out of the larvae and protracted developmental times of eggs, reduced the larval population available to infect cattle from August to October. Progeny were produced from late July to the following April. There was evidence that the eggs laid in late winter and early spring hatched at the same time. This probably is responsible for the "spring rise."

It is considered that the engorged females which drop in the early autumn represent the most important stage in the overwintering in the area studied.—M. D. MURRAY.

EUZEBY, J. A. (1957). Les espèces françaises d'Ixodoïdea et leur importance pathogène. **[Ticks and tick-borne diseases in France.]**—*Bull. Off. int. Epiz.* **47**, 601-609. **3275**

A general description of the species of ticks occurring in France with a indication of the regions in which they are found and the diseases transmitted by them. There is a summary of the species of ticks and the diseases of which they are the vectors for each of the commoner domestic animals, and mention of toxic jaundice of the dog and anaemia of birds as a direct sequel to tick infestation. There is a brief note on tick control.—W. E. PARISH.

THOMAS, P. L. & WATSON, H. H. (1958). **The occurrence in New Zealand of the northern poultry mite, *Ornithonyssus sylviarum* (Canestrini and Fanzago, 1877).**—*N. Z. vet. J.* **6**, 47-50. [Authors' summary modified.] **3276**

O. sylviarum was found on poultry on two farms in the Christchurch district, and is probably present on others. It is suggested that the use of 1% lindane or 4% malathion dusts, or sprays of piperonyl butoxide and pyrethrins will give control without risk of tainting or poisoning. Wild birds may be responsible for spreading the mite and should be prevented from gaining access to poultry houses.

RODRIGUEZ, J. L., JR. & RIEHL, L. A. (1958). **Malathion for control of chicken mites on hens in wire cages.**—*J. econ. Ent.* **51**, 158-160. [Authors' abst. modified.] **3277**

Aqueous sprays containing 0·5% or 1% actual malathion by volume were applied to battery cages with wooden frame-work by means of a power-driven sprayer for the control of *Dermanyssus gallinae*. Both concentrations of malathion provided good control of the chicken mite and also of the northern fowl mite, *Ornithonyssus sylviarum*. Complete control of chicken mites cages constructed entirely of wire was obtained with a single application of 4% malathion dust.

See also absts. **3257** (neo-rickettsia from ticks); **3458** (report, Gt. Britain).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

VERSYCK, M. & JACOB, H. (1958). La lutte anti-ténia dans l'Ituri. **[Control of cysticercosis in the Belgian Congo.]**—*Bull. agric. Congo belge* **49**, 155-164. [In French. Summary in Flemish.] **3278**

In the Bogoro-Gety zone the proportion of cattle with cysticercosis was estimated to be 20–30% in 1950 and 70–80% in 1953–1955. Several factors contributed to this increase: the Africans ate undercooked meat, housed calves in their own huts, were nomads and would stay with their animals and contaminate the pasture. Control measures, instituted in 1956, were the sterilization of all meat by boiling, the installation of latrines near roads, pastures and watering-places, the provision of huts for calves,

and the fencing of pastures and installation of watering--places. In the first 4 months of 1957 the proportion of affected carcasses had already fallen to 48·7%.—M.G.G.

BALOZET, L. (1958). La couleuvre fer à cheval, hôte intermédiaire de trois ténias du chat. [*Zamenis hippocrepis* **(a grass snake) as intermediate host of tapeworms of the cat.**]—*Arch. Inst. Pasteur Algér.* **36**, 41-54. **3279**

Z. hippocrepis snakes, common in the outskirts of Algiers, harbour cysts containing the larvae of *Spirocerca sanguinolenta* and cysticerci of *Diplopylidium* and *Mesocestoides*. A young cat was fed the intestine of such a snake, and killed 6 weeks later. Numerous *D. acanthotetra, D. nölleri* and *M. lineatus* were found.

—M.G.G.

TURNER, J. H. (1957). **Studies on the parasitic behavior of** *Strongyloides papillosus* **(Wedl, 1856) in sheep and goats.**—*Dissertation, Univ. Maryland* pp. 209. [Abst. from abst. in *Diss. Abstr.* **17**, 2721-2722.] **3280**

These studies concerned the course of infection of *S. papillosus* in experimentally and naturally infected lambs and kids; the clinical aspects and pathology of infestation; the course of migration of the larval parasites after percutaneous entry into the host; and whether or not acquired or passive resistance or immunity could be established.

Eight parasite-free lambs were infected by single, cutaneous applications of infective larvae. The number of larvae employed was different for each lamb and ranged from 25,000 to a million. Lambs exposed to 100,000 larvae or over died 13 to 41 days after infection.

Immunizing infections were induced in paired, parasite-free lambs in isolation pens by cutaneous applications of 10,000–30,000 larvae at 2-day intervals for 20 days. Additional lambs and kids were initially infected by cutaneous exposures of 30,000 larvae each, and then grazed on a clean pasture where they were subsequently exposed to infective larvae developing from eggs in their droppings. None of these animals developed acute symptoms. Half of the infected animals in pens and all on pasture were challenged several weeks thereafter by single, cutaneous exposures to 300,000 larvae, normally a lethal dose. Parasite-free controls were similarly exposed. The previously infected animals showed little effect of the challenge infection, whereas 2 of the 3 controls died and the third was severely affected.

Infective larvae penetrated the skin easily and were within the dermis 15 min. after exposure. Repeated applications of larvae resulted in a dermatitis manifested by erythema, urticaria, and increased sensitivity to touch. No great mechanical damage to the tissue resulted from larval penetration. The path of migrating larvae through the host's body was similar to that of other *Strongyloides* species.

Preliminary studies indicated that immunity to infestation was not transferable by injections of immune serum. An attempt to stimulate immunity in kids by the injection of larval homogenates also failed. At least 2 antibodies, as determined by paper electrophoretic studies, were probably contained in the beta and gamma serum globulins of infected animals. *In vitro* tests showed that oral and anal precipitates developed about infective larvae in immune serum.

PUROHIT, M. S. & LODHA, K. R. (1958). **Haemonchosis in a camel.** — *Indian vet. J.* **35**, 219-221. **3281**

The authors describe a fatal case in a camel of infestation of the abomasum with *Haemonchus longistipes*.—R. N. FIENNES.

BEMRICK, W. J., EMERICK, R. J., SHUMARD, R. F., POPE, A. L. & PHILLIPS, P. H. (1958). **The effect of bleeding versus previous infection on the resistance of lambs to subsequent infections of** *Haemonchus contortus*. — *J. Anim. Sci.* **17**, 363-367. **3282**

A previous infection with *H. contortus* and periodic bleeding without infection permitted the development of similar degrees of resistance to a subsequent infection with the nematode. This suggests that one of the most important factors in the development of resistance in lambs to challenge infections with *H. contortus* is the haemorrhage produced by blood-sucking of the worms.

GÜRALP, N., KAVANAUGH, J. & BAKER, D. (1957). **Some further evaluation of emetine therapy against sheep and goat lungworms.**—*Cornell Vet.* **47**, 515-524. **3283**

Eleven sheep and twelve goats harbouring *Dictyocaulus filaria, Protostrongylus rufescens* and *Muellerius capillaris* were given 0·15 ml. of a 1% solution of emetine per lb. body wt. by i/m injection, the dose being repeated after two days. The efficacy of the treatment was assessed by comparison of faecal examinations before and 15 days after treatment and by P.M. examination in one case.

M. capillaris was considered to have been eliminated from 75% of the infected animals. The treatment was less effective against *P.*

rufescens and ineffective against *D. filaria*. No toxic effects of the drug were observed at up to one and a half times the therapeutic dose, but a ram given a single dose at twice the therapeutic level (*i.e.*, 0·3 ml. per lb. body wt.) died within 45 hours. Treatment with a single dose was ineffective.—H. S. McTaggart.

Stefański, W. (1957). Badania nad leczeniem robaczycy płucnej owiec. Cz. II. Próby leczniczego działania niektórych leków przeciwrobaczych. **[Treatment of lungworm infestation in sheep. II. Evaluation of some anthelmintics.]**—*Roczn. Nauk rol.* **68,** Ser. E. 121-139. [In Polish. Summaries in French and Russian.] **3284**

10 ml. of 5% sodium fluoride administered intratracheally to 6 sheep and repeated after 2 days had no therapeutic effect. 1% aqueous solution of gentian violet, though active *in vitro* against *P. rufescens* and *D. filaria*, killed 3 sheep when injected intratracheally. 5% phenothiazine in ether and 20% camphor oil injected intratracheally to 14 sheep, twice with a 10-day interval, proved toxic and had no thereapeutic effect. Fouadin (stibophen) given i/m to 16 sheep on 2 successive days, in 20-ml. doses, had no effect on the lungworms and when given intratracheally to 11 sheep caused dullness, inappetence and dyspnoea lasting 3–5 days and death of 2 animals. Emetine hydrochlor. (1%) injected i/m in doses ranging from 4·5–19 ml. resulted in death of 18 out of 40 experimental sheep. K. is of the opinion that none of these drugs is suitable against *D. filaria* and that Lugol's iodine is more efficacious and less toxic. [See also *V.B.* **26,** 1683 & 2941.]—M. Gitter.

Raucheach, K. (1958). Beitrag zur Therapie der Thelaziosis der Rinder. **[Treatment of *Thelazia* infestation in cattle.]**—*Mh. VetMed.* **13,** 207-209. **3285**

The incidence of *Thelazia* infestation in cattle slaughtered in Arad, Roumania, is 33%. A new method of treatment is described. A cannula, 10 cm. long and 2–3 mm. in diameter, is inserted, *via* the nostril, into the nasolacrimal duct. Iodine soln. (1/2000) is given by means of a syringe attached to the cannula.—M.G.G.

Kelley, G. W., Olsen, L. S. & Hoerlein, A. B. (1958). **The influence of diet on the development of *Ascaris suum* in the small intestines of pigs.**—*Amer. J. vet. Res.* **19,** 401-404. [Authors' summary modified.] **3286**

Piglets obtained by hysterectomy were deprived of colostrum and reared in strict isolation to prevent uncontrolled infection with ascarids. They were given infective *A. lumbricoides* eggs while on a diet of rolled oats and water. Between 22 and 75 days after infection, each pig harboured an average of 139 worms (with a range of 0–657).

In another experiment, 6 pigs were given ascaris eggs while they were on a milk diet. 3 of the 6 had their rations severely reduced when larvae were migrating and coming back into the intestine. Although signs of severe respiratory dysfunction were present from 6 to 12 days after infection, no worms were found in the intestines. Thus larvae became established more readily in the intestine of pigs which were on diets of rolled oats than in those on milk.

Terhaar, C. J. (1957). **Carbon tetrachloride as an anthelmintic: its effect on and distribution in a parasite (*Ascaridia galli*) and its host.**—*Dissertation, Kansas State Coll.* pp. 102. [Abst. from abst. in *Diss. Abstr.* **17,** 2720-2721.] **3287**

Carbon tetrachloride was effective against adult *A. galli* but was of no value against the larval tissue phase of this parasite. It had no effect upon the viability of eggs of worms expelled from treated birds. Emulsification of the drug did not increase its efficacy although starvation of the host before treatment apparently did.

Carbon tetrachloride did not affect average weight gains of treated birds. Vaporized CCl_4, applied to the cuticle of *A. galli*, was lethal. The radioactive tracer method of analysis showed that the parasites had relatively greater uptake of C^{14}, expressed as CCl_4, than did any of the host's tissues. The amount varied between 0·008 and 0·076 mg. CCl_4 per worm. The carbon uptake was not correlated with either sex or weight of the worms.

The greatest uptake in any organ of the bird was in the caeca, followed by the duodenum. Most of the drug was apparently excreted by the lungs.

Riek, R. F., Turner, H. N., McKevett, M. & Roberts, F. H. S. (1958). **Adjustments for faecal worm egg counts from cattle based on faecal consistency and on age and body weight of host.** — *Aust. J. agric. Res.* **9,** 391-402. [Authors' summary modified.] **3288**

Results are reported of studies to determine whether interpretations of worm egg counts per gram of faeces would benefit from adjustments for faecal consistency, and for changes in faecal output associated with the age and body weight of the host. Adjustments for faecal consistency proved of little value. Adjustments for age or

body wt., however, were found to be important, and factors for adjustment to a standard age or weight are tabulated. Under field conditions age is more readily ascertained than weight, and estimates showed that prediction of faecal output from age varied only slightly from prediction from body wt.

RIEK, R. F. & KEITH, R. K. (1958). **Studies on anthelmintics for cattle: IV. The organic phosphorus compound O,O-dimethyl 2,2,2,-trichloro - 1 - hydroxymethyl phosphonate (Bayer L13/59).** — *Aust. vet. J.* **34**, 93-103. **3289**

This compound, marketed as "Neguvon," as an emulsion or an aqueous solution was a safe and effective anthelmintic against *Haemonchus placei* and *Oesophagostomum radiatum* at a dose rate of 2 g./100 lb. body wt. A dose of 5 g./100 lb. body wt. was also highly effective against *Bunostumum phlebotomum, Cooperia* spp. and *Trichostrongylus axei*. Fasting did not influence anthelmintic action and, with the exception of *Cooperia* spp., the drug was equally effective whether dosed into the rumen or the abomasum. It was more effective against *Cooperia* spp. when swallowed into the abomasum and thus premedication with sodium bicarbonate soln. (to bring about reflex closure of the oesophageal groove) will enhance efficiency against these species. A dose of 2·5 g./100 lb. body wt. may temporarily decrease the (*Cooperia* spp.) faecal egg count but a dose of 5 g./100 lb. appears to kill the worms.

More than 200 calves were treated in the field with doses up to 5 g./100 lb. without mortality. At the laboratory doses up to 12·5 g./100 lb. were safe, with one fatal exception. The higher doses may cause inappetence and diarrhoea for 48–72 hours, but recovery was rapid and there were no persistent toxic effects.

Studies on the effects of the drug on cholinesterase in the blood were inconclusive because there was a very wide range of pre-treatment levels and it appeared that a depression of cholinesterase activity may be recorded with no concurrent or succeeding signs of poisoning, and that fatal cases may occur with measurable quantities of the enzyme persisting in the blood. Toxicity appears to depend on individual susceptibility to inhibition of cholinesterase activity.

It is possible that the nature of the feed may affect the toxicity of the drug. In Queensland, calves grazing natural pasture and fed on lucerne chaff did not show signs of toxicity apart from temporary diarrhoea and increased respiration. However, 26 calves in Victoria in good to poor condition, grazing oats and barley and given a protein supplement, showed more severe symptoms but none died.

One of the advantages of the drug is a high degree of anthelmintic activity against immature worms.—H. McL. GORDON.

GORDON, H. McL. (1958). **Studies on anthelmintics for sheep: some organic phosphorus compounds.** — *Aust. vet. J.* **34**, 104-110. [Author's summary modified.] **3290**

The organic phosphorus compound, O,O-dimethylhydroxy-2,2,2-trichlorophosphonate (Bayer "L13/59") is a highly efficient anthelmintic against *Haemonchus contortus* in non-toxic doses. Doses of 2·5 g./100 lb. body wt., or less, sometimes caused a temporary reduction in worm egg production. The anthelmintic efficiency of this compound against *H. contortus* appeared to be independent of the oesophageal groove reflex, but against *Trichostrongylus* spp. it was only effective if injected or swallowed into the abomasum. It gave variable effects against *Oesophagostomum columbianum* even at dose levels which were toxic to some sheep.

The compound Bayer "L21/199" was effective against *H. contortus, Trichostrongylus* spp. and *Oes. columbianum* when injected into the rumen, but is too toxic for general use.

The compound known as "Dow ET-57" did not show much promise as an anthelmintic for sheep.

BEAVER, P. C. (1957). **Human disease from common worms of dogs and cats.**—*S. Afr. med. J.* **32**, 42-45. **3291**

Larva migrans, sometimes spoken of as "creeping eruption" or "sandworm" is caused by skin-penetrating nematode larvae. One such species is *Ancylostoma brasiliense* of dogs and cats. The term Loeffler's syndrome is used for a phase which occurs sometimes, transient pulmonary infiltrations with cough and peripheral eosinophilia suggestive of penetration of the lungs by a few larvae. Cases have been reported in which enormous numbers of larvae have been recovered from the sputum, after the stage of skin invasion. The later stages have also on occasion been reported from the intestine of the human host.

Originally the term visceral larva migrans was applied to an infestation caused by *Toxocara canis* and *T. mystax*; more recently *Capillaria hepatica, Gnathostoma* spp., *Dirofilaria* spp. and others have been incriminated. The *Toxocara* worms are the most important in this respect. The examination of backyard soil has often revealed *Toxocara* and other intestinal parasites of dogs and cats. Toddler-age children

thus run a risk where hygienic conditions are not good.

P.M., numerous parasites have been found in the brain. Examination of 54 eyes removed from children because of suspected retinoblastoma revealed nematode larvae in 24 and in several instances the larvae were *Toxocara*.

—W.A.P.

COUDERT, J. (1956). Intérêt des antigènes lyophilisés en parasitologie. **[Importance of lyophilized antigens in parasitology.]**—*Maroc méd.* **35**, 1257-1259. **3292**

A discussion of the reasons for the necessity of obtaining pure stable antigens of parasites to be used in diagnostic tests, with a description of a method used in the preparation of a freeze-dried antigen and its reconstitution. Such antigens have been used in the diagnosis of fluke infestation, hydatid disease and ascariasis.

—W. E. PARISH.

See also absts. **3373** (diseases of the c.n.s.); **3458** (report, Gt. Britain); **3463** (book, parasitic diseases).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

COTCHIN, E. (1957). **Spontaneous mammary neoplasms of the domestic animals.**—*Proc. R. Soc. Med.* **50**, 557-560. **3293**

A review of the incidence and type of spontaneous neoplasms arising in the mammary glands of domestic animals, with emphasis on their rare occurrence in the cow, mare, ewe and sow, and their relatively common incidence in the bitch and cat. The author gives a summary of the incidence of the different forms of the mammary tumours of the bitch examined by him, and indicates the common finding of mixed tumours and the high incidence of sarcomata in the malignant group.

The possible reasons for the species variation in incidence is discussed, comparing the differing effect of hormonal stimulation in the cow and in the dog and cat, and the possible relationship to pseudopregnancy in the bitch. The common occurrence of mucoid, chondroid and bony tissue in mixed tumours in the bitch may be associated with changes in the connective tissue of the gland during growth and involution.—W. E. PARISH.

WANDOKANTY, F. & UTZIG, J. (1958). Wpływ trójterpenów pięciocyklicznych wyosobnionych z żagwi brzozowej (*Polyporus betulinus*) na nowotwory złośliwe. **[Effect of pentacyclic triterpenes isolated from the fungus *Polyporus betulinus* on malignant tumours.]**—*Méd. vét., Varsovie* **14**, 148-151. [In Polish. Summaries in English and Russian.] **3294**

A review of literature.—M. GITTER.

GRANT, C. A. (1958). **Congenital tumours of calves. Report of two cases of "mesothelioma" and a tumour apparently of reticuloendothelial origin.**—*Zbl. VetMed.* **5**, 231-244. [In English. Summaries in French, German and Spanish. Author's summary modified.] **3295**

Congenital tumours in three calves are described. Two of these as well as most of the few cases previously reported can be suitably referred to as "mesothelioma." These tumours form multiple, small and discrete nodules or larger and confluent masses on the parietal and visceral serosal surfaces of the major body cavities. The two major morphological elements of these tumours, the covering cell layer and the cells forming the supporting structures, are derived from the superficial portion of the serosa and give a microscopic appearance of arborescence about fine or coarse central cores. Deeper structures are not involved. Although these calf tumours are undoubtedly congenital, the dams are apparently unaffected.

The third case differed from other types of tumours. Neoplastic lesions were found in ribs, the lungs, lymph nodes, and the liver. The morphology strongly suggests a reticuloendothelial origin. This case is apparently the only recorded instance of a widely metastasizing congenital tumour in any animal species.

POGUE, J. P. (1958). **Squamous cell carcinoma treated with radon implants.**—*Auburn Vet.* **14**, 107-110. **3296**

A squamous-cell carcinoma on the lower right eyelid of a Hereford bull was described. Since the bull was of considerable value, 6 radon implants, each equivalent to 7 millicurie, were inserted into the tumour. After several weeks the neoplasm regressed and the eye and surrounding tissues returned to their normal appearance.—R.M.

DMOCHOWSKI, L., SYKES, J. A., WYNNE, E. S. & RUSSELL, W. O. (1958). **Bovine ocular squamous carcinoma ("cancer eye") and its benign precursor lesions in the light of recent tissue culture and electron microscope studies.**—*Amer. J. Path.* **34**, 602. [Authors' abst. modified.] **3297**

Previous findings [*V.B.* **27,** 506] have been extended by studies on 1,200 living cattle observed for up to 4½ years. In the conjunctival sac carcinomas develop from hyperplastic plaques, some passing through a papillomatous stage. Investigations with the electron microscope showed that the spherical, eosinophilic intranuclear bodies previously observed in all 3 types of conjunctival lesions were nucleoli of characteristic shape and size.

Difficulties associated with obtaining primary cellular outgrowth of these lesions *in vitro* were discussed. From 70 lesions, primary growth was obtained in 40. Cultures of a number of lesions were maintained for 2 to 7 months and for 2 to 23 passages. Cells derived from 14 different lesions are at present in culture: 11 came from plaques, 2 from papillomas, and 1 from a carcinoma. Cellular changes observed in some of these cultures, in both stained and living states suggested the presence of a cytopathogenic agent in the lesions from which the cultures were derived.

SCOTTI, T. M. (1958). **The carotid body tumor in dogs.**—*J. Amer. vet. med. Ass.* **132,** 413-419. [Author's summary modified.] **3298**

A carotid body tumour which was removed surgically from a dog is described. There is a brief discussion of the chemoreceptor system and of certain clinical and pathological features of neoplasms of this system in man and in dogs, with particular emphasis on the carotid body tumour.

HELMBOLDT, C. F., JUNGHERR, E. L. & CAPARO, A. C. (1958). **Pulmonary adenomatosis in the chinchilla.**—*Amer. J. vet. Res.* **19,** 270-276. [Authors' summary modified.] **3299**

Pulmonary adenomatosis was seen in 19 of 206 chinchillas submitted for P.M. examination. Clinical signs consisted of dyspnoea, anorexia, lethargy, and debility; the course of the disease varied from one to six weeks. Gross lesions were not striking. Histological lesions consisted of focal interstitial pneumonia containing alveoli lined by non-ciliated cuboidal epithelium. These cells appeared to originate from bronchiolar epithelium. The histology was similar to that of pulmonary adenomatosis in man and sheep.

CRAIN, R. C. (1958). **Spontaneous tumors in the Rochester strain of the Wistar rat.**—*Amer. J. Path.* **34,** 311-335. [Author's summary modified.] **3300**

Two hundred spontaneous tumours were found in 189 of 786 albino rats, ranging in age from 18 to 24 months. Primary tumours were identified in all organs except those of the cardiovascular and locomotor systems. About one third were considered malignant. The most common tumours were, in order of incidence, fibroadenoma of the mammary gland, malignant lymphoma of the lung and mesenteric lymph nodes, and interstitial cell adenoma of the testis. Many of the tumours resembled those arising in similar sites in man. Comparison with previous reports of spontaneous tumours in rats showed two striking variations. In these rats there were few tumours of the skin and subcutaneous tissue and no thymic tumours.

KENZY, S. G., CONRAD, R. D. & FLUHARTY, D. M. (1958). **Further observations concerning Rous virus neutralizing antibodies and neoplasia. I. In farm flocks.**—*Avian Diseases* **2,** 167-172. [Authors' summary modified.] **3301**

Farm flocks experiencing severe losses associated with lymphoid tumors also appeared quite susceptible to the Rous agent on the basis of the Rous virus neutralization test. The possibility of utilizing the Rous neutralizing antibody test for the recognition of lymphoid-resistant and susceptible lines is discussed.

Unusually high incidence of subcutaneous lymphoid tumours occurred in one of 3 flocks investigated.

BENDIXEN, H. J. (1958). Undersøgelser over kvaegets leukose. 2. Kvaegleukosens kliniske diagnostik. **[Study of bovine leucosis. II. Clinical diagnosis.]**—*Nord. VetMed.* **10,** 273-301. [In Danish. Summaries in English, French and German. English summary modified.] **3302**

A review is given of the clinical manifestations of bovine leucosis based on 103 cases reported in the literature, and on reports from practising veterinarians and personal investigations in leucosis herds. Leucosis had subclinical and clinical phases. A detailed description is given of the clinical phase with special reference to early diagnosis and the differential diagnosis. The pattern of symptoms falls largely into 3 clinical groups: general neoplasia of the lymph nodes; involvement of internal organs; and infiltration of skin with associated lymph nodes.

A detailed description is given of nine cases. B. mentioned the value of the rectal exploration for the early diagnosis as well as formol-gel tests. In order to avoid a false diagnosis especially with regard to other tumours it is very important in all cases of doubt to supplement the

clinical observations with autopsy and histological examination.

CAMPBELL, J. G. (1958). **Recent investigations on avian leucosis and fowl paralysis.** — *Vet. Rec.* **70,** 64-66 & 67. **3303**

Erythroleucosis and myeloid leucosis, which often occur together in flocks, are caused by different virus agents and are two distinct pathological conditions. After experimental infection, a latent or masked phase of the virus of erythroleucosis has been demonstrated comparable to that occurring in the replication of other viruses. Although a tumour designated R.P.L.12 which produces a condition termed by some, visceral lymphomatosis, is claimed to be associated with a transmissible agent, the aetiology of lymphoid leucosis is uncertain. Fowl paralysis in its visceral form has also been termed visceral lymphomatosis, but should not be accepted as part of the leucosis complex. Three factors are at work in its transmission, inheritance, the age at exposure and the severity of exposure. A condition similar to experimental allergic encephalitis in mammals has been produced in fowls and has typical fowl paralysis symptoms. The agent responsible for erythroleucosis does not exhibit absolute cellular specificity, papillary cyst adenomata of the cortex of the kidney having been produced following intramuscular injection of the agent in chicks less than 12 days old. In normal fowls, lymphoid foci increase with age and some appear to possess invasive properties; such foci may be very early leucosis lesions. Control of leucoses by breeding immune stock or by developing immunity by means of a vaccine may be possible.—A. ACKROYD.

MOULTON, J. E. & JULIAN, L. M. (1958). **Histological reaction following transplantation of chicken lymphoma (RPL-16).** — *Avian Diseases* **2,** 123-131. [Authors' summary modified.] **3304**

Regression of transplantable lymphoma RPL-16 [see *V.B.* **24,** 3227] was accompanied by phagocytosis and fluorescence of tumour cells. Tumour cells from birds with rapidly growing tumours exhibited neither phagocytosis nor fluorescence.

See also absts. **3242** (papillomata in dogs); **3243** (neuromyxoma); **3362, 3363** (neoplasia in the thyroid); **3373** (c.n.s.).

NUTRITIONAL AND METABOLIC DISORDERS

ANON. (1957). **Nutrient requirements of domestic animals. V. Nutrient requirements of sheep.** pp. 33. Washington, D.C. National Academy of Sciences — National Research Council. Publication 504. $1.00. **3305**

This booklet briefly describes nutritional requirements and reviews at greater length nutritional diseases and deficiencies of sheep. There is a bibliography, and tables give the composition of foods.—R.M.

PFANDER, W. H., KELLEY, R. W., BROOKS, C. C., GEHRKE, C. W. & MUHRER, M. E. (1957). **Effects of steroid and steroid-like compounds on digestion of rations in ruminants. *In vivo* and *in vitro* studies using diethylstilbestrol, cholesterol, estrone, testosterone, cortisone and hexestrol.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 632. pp. 15. **3306**

In vitro studies using the artificial rumen showed that diethylstilboestrol (2–20 p.p.m.), cholesterol (20 p.p.m.), oestrone (20 p.p.m.), testosterone (10 p.p.m.) and cortisone (25 p.p.m.) all enhanced cellulose digestion, whereas hexoestrol (1·5 p.p.m.) depressed it slightly.

In *in vivo* studies with 15 sheep fed a cottonseed hull–casein ration the daily addition of 20 mg. stilboestrol to the diet improved the digestibility of cellulose and crude protein considerably and 10 mg. daily was almost as efficient. Some of the sheep given the higher dose showed abnormal symptoms.

A daily dose of 20 mg. testosterone, 1·5 mg. hexoestrol or 10 mg. of cortisone given to 9 sheep on a lucerne hay and maize ration increased the digestibility of the fat, fibre, cellulose and nitrogen-free extract in the diet (but not the protein), and slightly increased the total digestible nutrients of the ration.

The digestion of silage by steer calves fed daily 7·5 mg. hexoestrol did not differ significantly from that of the controls.

The authors conclude that stilboestrol and related compounds affect the utilization of foodstuffs in the gastro-intestinal tract probably through their effect on the bacteria. [The doses of hormones quoted in the summary differ from those given in the text.]—E. J. CASTLE.

SHRODER, J. D. & HANSARD, S. L. (1958). **Effects of orally administered stilbestrol upon growth and upon calcium and phosphorus metabolism in lambs.**—*J. Anim. Sci.* **17,** 343-352. [Authors' summary modified.] **3307**

The response of lambs to stilboestrol feeding (2 mg. a lamb daily) was measured using

autoradiograph techniques as an indicator for bone growth. In addition concurrent chemical and radiochemical blood and balance studies were made with growing lambs to determine the effects upon calcium and phosphorus metabolism. The primary effect of stilboestrol administration was growth stimulation. This was manifested by a reduction in faecal endogenous Ca of approx. 20% with little apparent influence upon Ca absorption from the gastro-intestinal tract. Phosphorus absorption was increased, but faecal endogenous P was only slightly decreased by the treatment.

SCHUMACHER, E. (1957). Zur Frage der Bekämpfung des Schaumzustandes im Panseninhalt des Rindes durch Silikon. I. Mitteilung: Schaumhemmungsversuche mit Modellösungen und Pansensaft. **[Control of foamy rumen contents with silicon. I. Foam inhibition tests with rumen juice.]**—*Schweiz. Arch. Tierheilk.* **99**, 446-460. [English, French and Italian summaries.] **3308**

The optimum concentration of highly-polymerized silicon preparations for inhibiting foaming in rumen juice was 0·3%.—R.M.

BROWN, L. R., JOHNSON, R. H., JACOBSON, N. L. & HOMEYER, P. G. (1958). **Effects of administration of oils and of penicillin on incidence and severity of bloat and certain other responses of cattle.**—*J. Anim. Sci.* **17**, 374-385. [Authors' summary modified.] **3309**

A proprietary water-dispersible oil derived from lard greatly reduced the incidence and severity of bloat, even during periods of very severe bloating, when added at 1 and 2% to the drinking water of steers grazing lucerne pasture. The effect was less in cattle fed in yards. In most instances the animals given oil had higher average daily weight gains than controls.

Procaine penicillin (75 mg./animal daily) appeared to reduce bloat when first administered, mixed with the food, to steers receiving green lucerne. However, later in the season, when the bloat-producing potential of the forage increased sharply, animals fed penicillin had a high incidence and severity of bloat, as did the controls. Penicillin feeding apparently had no effect on weight gains. Limited observations were made on the effect on bloat of various oils sprayed on fresh cut lucerne. Results indicated that 4 oz. of oil per animal daily greatly reduced bloat.

SOUTHCOTT, W. H. & HEWETSON, R. W. (1958). **Investigation on the use of peanut oil in bloat control.**—*Aust. vet. J.* **34**, 136-139. [Authors' summary.] **3310**

Peanut oil on the drinking water (12 oz. of oil per head per day), or on the drinking water and on a hay supplement (14 oz. of oil per head per day), reduced the incidence and severity of non-fatal bloat in cattle grazing clover-rich pasture, but failed to prevent sporadic deaths.

BROBERG, G. (1958). **Measurement of redox potential in rumen contents. IV. *In vivo* measurements.**—*Nord. VetMed.* **10**, 263-268. [In English. Summaries in Swedish and German. Author's summary modified.] **3311**

During *in vivo* measurements in the rumen of fistulated sheep, the author has shown that the redox potential (rH) lies at the level earlier observed with *in vitro* measurements in rumen contents [*V.B.* **28**, 1843].

The *in vitro* measurements have shown that rH decreases with increased bacterial activity. Confirmation of this was obtained from *in vivo* measurements with normal feeding (1 kg. of hay plus 300 g. concentrate).

When a ration composed of 150 g. hay and 500 g. concentrate was fed daily the rH increased after consumption of the concentrate.

It was possible to increase rH by introducing a large amount of oxygen into the rumen. The amounts required, however, were much larger than those which could be obtained under natural conditions, and the effect was soon over. Rumination did not affect rH even if it lasted for long periods.

DOLLAHITE, J. W. & ANTHONY, W. V. (1958). **Malnutrition in cattle on an unbalanced diet of mesquite beans.**—*Sthwest. Vet.* **11**, 209-212. **3312**

In many areas where trees of the *Prosopis* sp. grow, during times of drought 25%–50% of the cattle develop a serious disease characterized by emaciation and profuse salivation; 10% or more may die. Animals that recover usually relapse, even after 2–3 years, if moved from irrigated to dry pasture. The condition was reproduced experimentally by feeding cattle on beans from this tree. Anaemia and an inability to digest hay were observed. It is considered that the sugar in the beans alters the rumen flora so that the animal can no longer digest cellulose or synthesize the B vitamins efficiently.

—M.G.G.

JENSEN, R., FLINT, J. C., UDALL, R. H., DEEM, A. W. & SEGER, C. L. (1958). **Parakeratosis of the rumens of lambs fattened on pelleted feed.** — *Amer. J. vet. Res.* **19**, 277-282. [Authors' summary modified.] **3313**

Ruminal parakeratosis was characterized by hardening, enlargement, and clumping of mucosal papillae and, microscopically, by accumulation of excess layers of keratinized, nucleated, squamous epithelial cells on the papillae. In each of three experiments, lambs fattened on pelleted feed developed more ruminal parakeratosis than lambs fattened on the same feed ingredients in the coarse state. Lambs which had normal rumens had a significantly higher rate of gain in body weight than lambs which had ruminal parakeratosis.

TOMLIN, D. C., WALLACE, H. D. & COMBS, G. E., JR. (1958). **The influence of certain antibiotics on the palatability of swine rations.** —*J. Anim. Sci.* **17,** 42-46. **3314**

In trials with 62 pigs, chlortetracycline enhanced the palatability of the rations and was preferred to oxytetracycline, phenoxymethyl penicillin and erythromycin. Oxytetracycline and phenoxymethyl penicillin did not clearly improve or depress palatability. Food containing erythromycin was avoided when other food was available. It is concluded that erythromycin is unsuitable for fattening pigs.—M.G.G.

ANON. (1957). **Enterocolitis in chinchillas fed chlortetracycline.** — *J. Amer. vet. med. Ass.* **130,** 102. **3315**

When pellets containing 0·2 mg. chlortetracycline per oz. were fed to 450 chinchillas for 12 to 18 months 50 died showing similar symptoms. The P.M. lesions are described. There was evidence of a haemolytic staphylococcal infection. The method of prevention of the condition is described.—E. J. CASTLE.

ROGERS, T. A. (1958). **Inhibition of glucose uptake by acidosis *in vitro*.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 646-647. [Author's summary modified.] **3316**

The glucose uptake of rat diaphragms *in vitro* at pH 7·4 and 6·8 was compared. The acid medium inhibited glucose uptake but the degree of inhibition could be decreased by adding insulin to both media. At insulin concentrations in excess of 0·08 i.u./ml., glucose uptake was the same at each pH. With 0·008 i.u./ml. insulin a pH of 7·1 was almost as inhibitory as pH 6·8. There was no enhancement of glucose uptake at pH 7·8.

DIKSHIT, P. K. & SRIRAMACHARI, S. (1958). **Caudal necrosis in suckling rats.**—*Nature, Lond.* **181,** 63-64. **3317**

Caudal necrosis in unweaned rats, which was not attributable to dryness of the air, was eradicated by increasing the fat content of the mothers' diet from 3% to over 6%, and by providing a concentrate of vitamin A acetate instead of crude shark-liver oil as a source of vitamin A. It is concluded that the chief cause of the condition was a deficiency of essential fatty acids.—M.G.G.

SCHMIDT-NIELSEN, B. & OSAKI, H. (1958). **Renal response to changes in nitrogen metabolism in sheep.**—*Amer. J. Physiol.* **193,** 657-661. **3318**

As in camels, a low protein intake resulted in decreased excretion of urea by the kidneys of sheep.—R.M.

GAUGUSCH, Z. & NIEMCZYCKA-WĘGRZYN, S. (1957). **Studies on harmlessness of orally administered hydrolisate of keratin for animals.**—*Biul. Inst. Wet. Pulawy* **1,** 86-88. [In English. Authors' summary modified.] **3319**

Keratin hydrolysate may be used for fowls and other domestic animals, as a valuable protein supplement to the diet. No harmful effect was observed in birds and animals given keratin hydrolysate orally, or in mice injected subcutaneously with 0·2 ml. of hydrolysate in 1 : 100 dilution.

DUPUIS, Y. (1957). Lactose et utilisation du calcium. I. Influence du lactose sur les échanges calciques et sur le développement du squelette du rat en croissance soumis à diverses conditions alimentaires. **[Influence of lactose on calcium retention in growing rats.]** —*C. R. Soc. Biol., Paris* **151,** 1722-1725. **3320**

Lactose, as 12 % of the diet, increased the absorption and retention of Ca in young male rats. Their femurs and tibias were heavier than those of control rats, but the proportion of Ca in the ash was similar to that in controls.

—M.G.G.

FERREIRA NETTO, J. M. & MOREIRA, H. A. (1957). Hemograma de leitões confidados recebendo cobalto adicional à ração. **[Blood picture of pigs receiving cobalt supplements.]** —*Arch. Esc. Vet. Minas Gerais* **5,** 9-14. [In Portuguese. Summary in English.] **3321**

Newly-weaned piglets were given meal containing 1·9 mg. Co/kg. After 8 weeks their blood picture did not differ from that of similar pigs not given cobalt; there was no evidence of polycythaemia. Food consumption and gain in body wt. appeared to be increased in the group receiving cobalt.—R.M.

BOTHWELL, T. H., PRIBILLA, W. F., MEBUST, W. & FINCH, C. A. (1958). **Iron metabolism in the pregnant rabbit. Iron transport across the placenta.**—*Amer. J. Physiol.* **193**, 615-622. **3322**

The amount of Fe transported from maternal plasma to the foetus increased progressively with age and weight of foetus. By the end of pregnancy 90% of the Fe turnover in the plasma of the dam was directed to the foetus. Most of the foetal Fe was not incorporated in haemoglobin. Transport across the placenta occurred against a concentration gradient; uptake of Fe by placenta was an active process independent of the foetus.—R.M.

HALKETT, J. A. E., PETERS, T., JR. & ROSS, J. F. (1958). **Studies on the deposition and nature of egg yolk iron.**—*J. biol. Chem.* **231**, 187-199. [Authors' summary modified.] **3323**

The iron metabolism of the laying hen was studied by the use of Fe^{59}. Allocation of iron between haemoglobin and egg yolk formation was observed, both upon initial injection and upon subsequent breakdown of r.b.c. at the end of their life. Haemoglobin and egg yolk apparently both draw upon the plasma iron pool. The average r.b.c. life for the small (0·9 kg.) hens studied was 24 days.

Radioautographic studies showed that iron is deposited in egg yolks in a concentric manner and that iron deposited in egg yolks does not exchange with plasma iron. Chemical studies on egg yolks, including those containing tracer iron, indicate that iron in egg yolk is in the ferric state, that it is not held in specific organic combination, and that its properties are due mostly to a strong binding by the phosphoprotein present.

VANSCHOUBROEK, F. (1958). Onderzoek naar het magnesiumgehalte van het bloedserum van met melk gevoederde slachtkalveren. **[Magnesium content of blood serum from milk-fed calves.]** — *Vlaam. diergeneesk. Tijdschr.* **27**, 125-135. [In Flemish. Summaries in English, French and German. English summary modified.] **3324**

Blood from 97 male calves, fattened with whole milk or a mixture of whole milk and skim milk, was examined. The mean magnesium content of the blood serum was 1·87 mg.%. Three of the calves had a magnesium content lower than 0·8 mg.%, but clinical symptoms of hypomagnesaemia were not observed.

There was a positive, but not statistically significant correlation between the Mg. content of the serum and the daily weight gain. This seems to indicate an increase in Mg content rather than a decrease, when the daily gain increased.

There was a negative correlation between Mg and the haemoglobin content of the blood serum. This coefficient, although not statistically significant, does indicate that there was no decrease in the Mg content when the haemoglobin content decreases.

There was no relationship between Mg and Ca content of serum, at least within the limits of the magnesium values found in these investigations. [See also *V.B.* **28**, 1859].

KLUSSENDORF, R. C. & PENSACK, J. M. (1958). **Newer aspects of zinc metabolism.**—*J. Amer. vet. med. Ass.* **132**, 446-450. **3325**

Zinc was biologically available to pigs and fowls when it was supplied in an antibiotic supplement in which some zinc was chemically bound to the antibiotic and some was present in complex organic compounds. The favourable growth rates, compared to controls, indicated that the antibiotic was available also. Zinc supplementation had no effect on the differential leucocyte count, and zinc was not stored in the edible tissues of the pigs and fowls nor in eggs. —M.G.G.

GUNN, S. A. & GOULD, T. C. (1958). **Role of zinc in fertility and fecundity in the rat.** — *Amer. J. Physiol.* **193**, 505-508. **3326**

Zinc derived from the prostate gland was normally present in rat semen. It was labelled by injecting radioactive zinc into male rats. 1½ hours after coitus labelled Zn was detected in the entire reproductive tract of the female. The removal of a large proportion of Zn from semen by prostatectomy had no harmful effect on fertility or fecundity.—R.M.

MILLAR, M. J., FISCHER, M. I., ELCOATE, P. V. & MAWSON, C. A. (1958). **The effects of dietary zinc deficiency on the reproductive system of male rats.**—*Canad. J. Biochem. Physiol.* **36**, 557-569. [Authors' abst. modified.] **3327**

Dietary zinc deficiency produced by feeding a zinc-poor diet (0·5μg. zinc per g.) to weanling rats for 8 weeks caused marked retardation in body growth, depressed growth and development of testes, epididymes, accessory sex organs, and pituitary glands, and in many cases severe atrophy of testicular germinal epithelium. All the observed changes produced by zinc deficiency except the testicular atrophy were reversed when zinc was replaced in the diet. If testicular atrophy had occurred, neither testis

nor epididymis regained normal size, function, or zinc concentration.

ELLIS, W. C., PFANDER, W. H., MUHRER, M. E. & PICKETT, E. E. (1958). **Molybdenum as a dietary essential for lambs.**—*J. Anim. Sci.* **17,** 180-188. [Authors' summary modified.] **3328**

The addition of Mo and Cu to rumen micro-organisms obtained from sheep fed on lucerne increased the *in vitro* degradation of cellulose to the same degree as the addition of lucerne ash. Washed rumen organisms from sheep fed on lucerne contained about 1 p.p.m. of Mo on a dry fat-free basis. Lambs receiving a ration with 2·36 p.p.m. of Mo grew faster than controls whose ration contained 0·36 p.p.m. The supplementary Mo increased the digestibility of cellulose but not of the other proximate ration constituents. It is concluded that Mo is required by lambs for optimum cellulose digestion, and that part of the beneficial effect of lucerne ash on ruminants fed rations of poor quality with a high roughage content is due to its Mo content.

HAAG, J. R. & ADAMS, F. W. (1958). **Tissue copper relationships and copper status of cattle.**—*Fed. Proc.* **17,** 477. [Authors' abst. modified.] **3329**

There is a wide range of copper content in foods, tissues and soils in Oregon. This study deals with the copper content of 456 pairs of blood and liver samples taken over several years. Logarithms of plasma Cu values plotted against corresponding liver Cu values form a graph in which two straight lines intersect at 33 p.p.m. liver Cu (dry basis). From 33 to more than 300 p.p.m. liver Cu, plasma averages 0·9 μg. per ml. Cu which is considered normal for cattle. From 2 to 33 p.p.m. corresponding plasma values vary from 0·2 to 0·9 μg./ml.; in this range plasma levels reflect liver stores. Liver Cu stores in turn variously reflect Cu intake and factors influencing Cu utilization. Liver Cu data are not available for an area in which average blood plasma values as low as 0·06 μg./ml. were obtained. It is significant that under a wide variety of conditions Cu status, as measured by tissue contents, has invariably responded to conservative supplementation with copper sulphate (5–10 p.p.m. Cu in dry-matter intake). In one area, restoration of normal blood copper was not accompanied by increased live-weight gains.

MYLREA, P. J. (1958). **Copper-molybdenum-sulphate-manganese interaction and the copper status of cattle.**—*Aust. J. agric. Res.* **9,** 373-384. [Author's summary modified.] **3330**

The influence of molybdenum, inorganic sulphate, and manganese upon the copper status of cattle was investigated. The mean liver copper concentration increased for steers on a basal diet containing 7·6 p.p.m. copper, 2·4 p.p.m. molybdenum, 91 p.p.m. manganese, and 0·03% sulphate. In steers on a similar diet but with the sulphate content increased to 0·55%, with or without an increase in the manganese content to 391 p.p.m., there was a reduction in the liver copper concentrations but not to low levels. There was also an increase in the serum inorganic sulphate levels. On increasing the molybdenum content to 9·2 p.p.m. there was a further reduction, to low levels, in the liver and blood copper concentrations of steers on the high sulphate diets but there was no definite effect on those on the low sulphate diet. Manganese again appeared to be without effect. It was concluded that there was a molybdenum–sulphate interaction with copper in cattle but that manganese was without effect. Despite the very low liver and blood copper levels attained, and maintained for 15 weeks, there was no clinical evidence of hypocuprosis. The mineral and sulphate levels applied in some of these treatments are similar to those found in pastures from areas in New South Wales where copper deficiency in cattle occurs. The levels in pastures, as related to the results of this trial, are discussed.

VAN KOETSVELD, E. E. (1958). **The manganese and copper contents of hair as an indication of the feeding condition of cattle regarding manganese and copper.** — *Tijdschr. Diergeneesk.* **83,** 229-236. [In English. Summaries in French, German and Dutch. English summary modified.] **3331**

In general coloured hair contains more trace elements than white hair. Hair of healthy adult animals contains on an average 12 p.p.m. Mn and 10 p.p.m. Cu.

Manganese or copper deficiency syndromes are accompanied by low Mn or Cu content of the hair, less than 8 p.p.m. in each case. The manganese content of the hair can rise to 80 p.p.m. but that of copper is seldom above about 15 p.p.m.

Infertility was associated with less than 8 or more than 20 p.p.m. of Mn and with 40 p.p.m. Mn or more nymphomania is often seen.

At parturition the Mn content of the hair of healthy cows decreases and increases to normal again after parturition. The copper content remains normal.

Calves from healthy adults are born with low Mn content of the hair (on average 3 p.p.m.

Mn) and so the liver Mn content is rather low, about 8 p.p.m. in dried liver, against the normal for adult cows of 12 p.p.m. The copper content of the hair of new-born calves is normal, on an average 9 p.p.m., but the liver Cu content is high (100–650 p.p.m. in dried liver).

Samples taken at the end of the summer or at the beginning of the winter reflect the feeding conditions regarding Mn and Cu during the previous pasture time. By examining hair grown during the winter, it is possible to estimate ultilization by the animal of Mn and Cu of the food.

HENRY, M. (1957). Sur l'absorption et l'excrétion du potassium et du sodium chez le porc. **[Absorption and excretion of potassium and sodium in the pig.]**—*C. R. Soc. Biol., Paris* **151,** 1682-1686. **3332**

Four pigs were subjected to stress for about a week—cramped quarters, a noisy environment, and also (for 2 pigs) an environmental temp. of 28°C. An initial retention of Na but a progressive elimination of K was observed. The establishment of a negative K balance led to pronounced muscular dystrophy. Comparison of the faecal and urinary excretion of Na suggested that the intestinal absorption of Na in the pig is not a purely passive phenomenon.—M.G.G.

KAISER, I. H. & CUMMINGS, J. N. (1958). **Plasma electrolytes of the pregnant ewe and fetal lamb.** — *Amer. J. Physiol.* **193,** 627-633. **3333**

Blood samples were collected from 65 ewes and 85 of their lambs between 77 and 142 days of gestation. Na conc. increased in ewe and foetus as pregnancy progressed, but it was always lower in the foetus. K increased rapidly in the foetus and by the 106th day it exceeded the maternal conc. Ca and Mg always exceeded maternal conc. Chloride conc. tended to parallel that of Na in ewe and foetus. Bicarbonate and phosphate remained relatively constant. Maternal proteins decreased and foetal proteins increased during pregnancy. Lactate was high in ewe plasma at 70 days and fell steadily towards term.

I. BRYANT, F. J., CHAMBERLAIN, A. C., SPICER, G. S. & WEBB, M. S. W. (1958). **Strontium in diet.**—*Brit. med. J.* June 14th, pp. 1371-1375. [Authors' summary.] **3334**

II. ANON. (1958). **Radioactive strontium in food and bone.**—*Ibid.* pp. 1400-1401. **3335**

I. Analysis of the stable strontium and strontium–90 content of foods in Wales and the west and north of England enables an estimate of the average intake in diet to be made. It is found that the mean strontium–90/calcium ratio in the adult diet in the summer of 1957 was 5·6 $\mu\mu$c./g. This is about the same as the ratio in the milk portion alone. Individuals who draw their milk and other food supplies from farms with high rainfall and acid- or calcium-deficient soils may have significantly higher strontium–90/calcium ratios in their diets, but the extreme variation is unlikely to exceed a factor of 5.

The mean stable strontium/calcium ratio in the diet was 1,200 μg./g., about four times the corresponding ratio in milk. There appears to be a discrimination of about 4:1 against strontium in favour of calcium in uptake from food to human bone. The strontium–90/calcium (S.U.) ratio in newly laid down bone is deduced to be between 1 and 2 S.U. for individuals on mixed diet.

II. An annotation on the amounts of radioactive strontium found in foodstuffs (especially milk) and in bone, and its influence on health and the incidence of diseases such as leucaemia. —R.M.

LOUGH, S. A. (1958). **Strontium 90 measurement in foods.**—*J. Milk Tech.* **21,** 5-6. **3336**

The number of strontium units in powdered milk from Perry, New York, rose, with fluctuations, from 0·47 in April 1954, to 4·6 in June 1957. (One strontium unit = one $\mu\mu$c. of Sr 90 per g. of Ca). It is estimated that children fed on this milk would develop bones containing about 3·7 strontium units (the maximum permissible skeletal ratio is 100 strontium units). Preliminary analyses of human milk and of milk drunk by the mother suggested that human milk may contain as little as one tenth of the strontium units in the dairy milk.—M.G.G.

I. BAKER, N., TUBIS, M. & BLAHD, W. H. (1958). **Metabolic and nutritional studies in mice with a hereditary myopathy (dystrophia muscularis).** — *Amer. J. Physiol.* **193,** 525-529. **3337**

II. BAKER, N., BLAHD, W. H. & HART, P. (1958). **Concentrations of K and Na in skeletal muscle of mice with a hereditary myopathy (dystrophia muscularis).**—*Ibid.* 530-533. **3338**

I. The authors studied the muscular dystrophy reported by Michelson *et al.* [*Proc. Nat. Acad. Sci.* **41,** 1079 (1955)]. Parenteral administration of several vitamins failed to reverse the dystrophy. The metabolic rate, concentration of glucose, cholesterol and protein-bound iodine in plasma, and liver cholesterol did not differ from that of normal mice.

II. In dystrophic mice the amount of K per g. of muscle and exchangeable body potas-

sium was 20% less than that in normal mice; the amount of Na/g. muscle was 50% more than normal. These results are similar to those obtained in muscular dystrophy in human beings, rabbits and calves.—R.M.

USHIJIMA, J. (1957). **Biochemical studies on so-called osteomalacia (*Osteodystrophia fibrosa*) in horses. I. The chemical composition per unit-volume of the bone.** — *Jap. J. vet. Res.* **5**, 185-196. [In English.] **3339**

U. suggested that a more accurate comparison of the mineral composition of healthy and diseased bone could be made if the results were expressed in g./100 ml. bone instead of percentage composition of dried bone or ash. He determined Ca, P, Mg and total nitrogen in bone from osteofibrosis in 178 slaughtered horses. The significance of change in composition of bone from these cases will be discussed in a future paper.—R.M.

GROTH, A. H., JR. (1958). **The comparative histopathology of rickets and an osteodystrophy in immature Iowa swine.**—*Amer. J. vet. Res.* **19**, 409-416. [Author's summary modified.] **3340**

Tissue sections from the distal epiphysis of ribs of 48 pigs from 47 herds showed a bone disease which was manifested clinically by increased pliability of the rib shaft and enlargement of the distal epiphysis. Rib sections from 2 pigs infected with swine fever virus were also examined.

Examination revealed a widening of the zone of columns and the vesicular zone of the cartilage, suppressed cartilage breakdown, thin distorted trabeculae in the primary spongiosa that contained necrotic and uncalcified cartilage, and aplasia and hypoplasia of the osteoblasts. In many sections, there was hypoplasia and, in some, hyperaemia of the bone marrow. Rib sections from the pigs infected with swine fever showed haemorrhage at the zone of cartilage breakdown, in addition to other lesions.

The histological lesions did not resemble those of rickets. There was no excess of osteoid tissue and the cartilage lacked vascular "brushes." It is possible that these pigs were fed deficient rations, but most of the cases were observed in the summer when there probably would be enough sunlight to prevent rickets, even under unfavourable conditions.

The histological picture suggests the presence of an agent that prevented or suppressed cartilage breakdown, causing either a hypoplasia or suppressed differentiation of the osteoblasts, and an increase in the permeability of the "vascular buds."

Swine fever or swine influenza viruses were suggested as possible aetiological agents. Swine fever virus, introduced either during infection or as an immunizing agent, could produce the bone lesions. It was also suggested that the production of the disease by swine fever virus may be dependent upon a partial vitamin A or calcium deficiency, or both. Similar rib lesions have been reported in human beings with influenza, suggesting that swine influenza virus may be a possible aetiological agent.

CHRISTENSEN, N. O., ELKJAER, R., ENGELUND, A., MUNCH, T. & TERP, P. (1958). **Studies on the absorption of vitamin A. II. Experiments on liver storage in rats and pigs.** — *Nord. VetMed.* **10**, 49-62. [In English. Summaries in Danish and German. Authors' summary modified.] **3341**

The absorption of vitamin A was investigated by means of liver storage tests in rats and pigs. The vehicles used for oral or i/m administration were arachis oil, ethyl oleate, and sorbimacrogol oleate 300 (Tween 80). Oral and intramuscular administration of vitamin A in aqueous dispersion caused a sharp increase in the vitamin A content of the liver, followed by a rapid decrease. Oral administration of vitamin A in oil also raised the liver content, but a little later than when vitamin A was given in aqueous dispersion. I/m injection of vitamin A in oil or ethyl oleate did not significantly affect the liver content. Experiments in rats revealed that after i/m injection of vitamin A in oil about 50% of it leaked to the subcutaneous region. The remainder could be recovered quantitatively from the muscles up to 3 weeks after administration. Vitamin A injected i/m in aqueous dispersion, however, was absorbed rapidly (within 2–3 days) and did not leak to the subcutaneous region. It is concluded that the most suitable vehicle and route of administration for vitamin A therapy cannot be judged solely on liver storage.

DE MAN, T. J., ROBORGH, J. R. & TEN HAM, E. J. (1958). **Effect of the method of administering massive doses of vitamin A on the liver storage in rats.**—*Tijdschr. Diergeneesk.* **83**, 380-386. [In Dutch. Summaries in English, French and German. English summary modified.] **3342**

Experiments with rats revealed a better liver storage of vitamin A when given orally as a massive dose from an aqueous dispersion than

from an oily solution. Only a very small percentage of the vitamin A from an oily solution, administered intramuscularly, was stored while from an aqueous dispersion about 60% could be recovered in the liver.

The liver storage from an aqueous dispersion of vitamin A, given intravenously, proved to be about 70% of the applied dose.

The vitamin A content of liver decreased very slowly in 4–6 weeks after administration of the vitamin, indicating that a liver depot of a sufficiently high level was able to supply the necessary amounts of vitamin A to the animal for a considerable length of time. [In an appendix to this paper, R. van Strik gave a statistical analysis of the experiment data.]

WINTER, H. (1958). **Observations on nutritional encephalomalacia of chickens in a warm climate.**—*Aust. vet. J.* **34**, 77-81. **3343**

Nutritional encephalomalacia (N.E.) has been the most important cause of death amongst the chickens in the flock of the University Farm (Queensland). In 1956 the first six hatches were fed a ration calculated to contain adequate alpha-tocopherol and supplemented with stabilized vitamins A and D_3, not of cod-liver oil origin. Time elapsing between mixing feed and ingestion by the chickens is not given. Of 1235 chickens three weeks old, 36 died from N.E. up to 12 weeks of age. The same ration supplemented with 40 mg./kg. alpha-tocopherol was fed to the next two hatches (178 chickens) and no cases of N.E. occurred.

In a second experiment a ration was oxidized (Adamstone's ferric chloride method). One group supplemented with 2% cod-liver oil lost 16 of 33 chickens (to 7 weeks), with N.E., groups supplemented with 2% cod-liver oil and 30 or 60 mg./kg. alpha-tocopherol lost none of 39 and 28 chickens, and 32 chickens fed unoxidized ration plus 2% cod-liver oil lost 4 with N.E.

W. suggests that possibly prolonged storage at relatively high temperatures causes oxidation of fats, other than those in cod-liver oil, as well as of vitamin E, although there appears to be no experimental evidence presented.—L. HART.

ANON. (1957). **Vitamin B_{12} in animal nutrition.** pp. 99. Rahway, N.J.: Merck & Co., Inc. **3344**

This is a valuable guide to the present position of vitamin B_{12} in animal nutrition. Recent literature is reviewed extensively but selectively and references are given at the end of each chapter. Tables and diagrams from the publications cited are included in the text. There is a comprehensive subject index.

The initial chapters deal with general information and the history of the vitamin and include a description of its general characteristics and structure and the forms in which it is produced. Methods of assay are given and the importance of the vitamin in various metabolic processes indicated. A list of vitamin B_{12} activity of various foodstuffs and other materials is given.

Further chapters give the requirements for growth and effect of the vitamin on reproduction and carcass quality in poultry and pigs, and describe the symptoms of its deficiency in these species. Shorter chapters deal with turkeys and calves and some reference is made to horses, dogs and certain fur animals.

The interrelationship between B_{12} and substances in poultry nutrition such as antibiotics and amino-acids and between B_{12} and cobalt in ruminants is discussed.—E. J. CASTLE.

SINGH, R. & MERILAN, C. P. (1957). **Influence of temperature on vitamin levels in bovine blood. A study of B-vitamins and vitamin C levels in the blood of Brahman, Santa Gertrudis and Shorthorn heifers reared under different environmental temperature conditions.** —*Res. Bull. Mo. agric. Exp. Sta.* No. 639, pp. 40. [Authors' summary modified.] **3345**

There is no significant difference in blood ascorbic acid levels of Shorthorn calves reared at different environmental temperatures. Zebu and Santa Gertrudis calves reared at 50° and 80°F. had lower blood ascorbic acid levels than controls housed in an open shed.

There was no noticeable effect of environmental temp. on the amounts of pantothenic acid and riboflavin in blood from calves of the three breeds. There was no definite relation between the blood vitamin levels of calves and their age or season of the year except that all had maximum riboflavin values during July, August, and September.

The Shorthorn calves kept at 80°F. had distinctly lower blood content of niacin and thiamine than those reared at 50°F. Their values were also lower than those for zebu and Santa Gertrudis calves maintained at 80°F.

LUNDBAEK, K., NIELSEN, K. & RAFAELSEN, O. J. (1958). **Mode of action of oral antidiabetic compounds.**—*Lancet* May 17th, 1036-1039. [Authors' summary modified.] **3346**

On present evidence the hypoglycaemic effect of the oral antidiabetic drugs cannot be

explained by interference with the endocrine balance. Among the modes of action of these compounds inhibition of the output of glucose by the liver and enhancement of the uptake of glucose at the periphery seem to be acceptable. The details of the changes in enzyme activities probably involved in the hepatic and peripheral effects have not been elucidated. It is suggested that the hypoglycaemic effect of the oral antidiabetic compounds is determined not by the presence or absence of insulin but by the severity of the diabetes.

GREER, M. A. (1957). **Goitrogenic substances in food.**—*Nutr. Symp. Ser.* No. 15. pp. 72-76. [New York: National Vitamin Foundation Inc.] [Author's summary modified.] **3347**

The more recent literature on the production of goitre by various foodstuffs is briefly reviewed. The active antithyroid agent in turnips and other goitre-producing vegetables has been identified as goitrin. It is present in the plant, and in the seeds of most *Brassica* species, as progoitrin, an inactive compound. Goitrin is apparently liberated from progoitrin only through specific enzymic hydrolysis by a thioglycosidase contained in the plant or seed itself. Cooking destroys this enzyme and thus negates its goitrogenic potency by preventing the liberation of goitrin from progoitrin. Although the ingestion of considerable quantities of goitrogenic foods may contribute to the development of goitre under certain circumstances, it is very difficult to incriminate them as an aetiological factor in the vast majority of goitrous patients.

BARNES, C. M., GEORGE, L. A., JR. & BUSTAD, L. K. (1958). **Thyroidal I^{131} uptake in fetal sheep.**—*Endocrinology* **62,** 684-686. [Authors' abst. modified.] **3348**

The I^{131} concentration of the foetal thyroid gland in sheep was found to increase exponentially during the second to the fifth month of life. The total I^{131} in the foetal thyroid one month before parturition approximated the daily dose of radioiodine administered to the dam. In the fifth month of gestation the I^{131} conc. in the thyroid gland of the foetus exceeded that of the dam's thyroid.

ADLER, J. H., ROBERTS, S. J. & DYE, J. A. (1958). **Further observations on silage as a possible etiological factor in bovine ketosis.**—*Amer. J. vet. Res.* **19,** 314-318. [Authors' summary modified.] **3349**

The presence of ketone bodies has been demonstrated in grass and maize silage. The ketone body content of silage from different silos may vary significantly, with particularly high levels in grass silage which contains excessive butyric acid. A high level of ketone bodies was apparent in maize silage in one instance.

There appears to be a relationship between the ketone body content of the silage and the incidence of ketosis, probably because ketogenesis is related to butyric acid production. Clinical observations indicate that silage which contains butyric acid is a predisposing factor in ketosis.

HOLTZ, A. H. (1957). **17-Ketosteroids and pseudo ketosteroids in cattle.**—*Acta endocr., Copenhagen* **26,** 75-90. **3350**

The Zimmermann test for ketosteroids gave false results with cattle urine, for 90% of Zimmermann-positive substances were not steroids but ionone derivatives of carotenoids present in the diet.—R.M.

I. SCHULTZ, L. H. (1958). **Use of sodium propionate in the prevention of ketosis in dairy cattle.**—*J. Dairy Sci.* **41,** 160-168. **3351**

II. SCHMIDT, G. H. & SCHULTZ, L. H. (1958). **Effect of feeding sodium propionate on milk and fat production, roughage consumption, blood sugar, and blood ketones of dairy cows.** —*Ibid.* 169-175. [Authors' summaries modified.] **3352**

I. In a study involving 100 high-producing cows, one-half served as controls and one-half was fed 115 g. of sodium propionate daily for 6 weeks, starting at calving. Blood analyses and milk production showed an advantage for the propionate-fed cows in terms of higher blood sugar levels, lower blood ketones, and higher milk production, greatest differences were observed 3 weeks after calving. At 7 weeks after calving, after the propionate had been discontinued, there were no significant differences between the two groups. During the 6 week feeding period, nine cows in the control group developed ketosis which required treatment. In the treated group, the dose of propionate was increased for two cows because of increased ketonaemia and decreased glycaemia.

II. There were no significant differences in milk production, hay consumption, blood sugar levels, blood ketone levels, or weight gains or losses attributed to the feeding of 230 g. of sodium propionate daily. There was a slight but non-significant fall in butterfat.

The feeding of propionate resulted in higher levels of all the volatile fatty acids in the rumen for the first 3 hours after feeding, particularly the propionic. From 3 to 9 hours after feeding,

the concentrations of rumen acids from the two feeds were quite similar. It was calculated that all of the administered propionate had disappeared in 7 hours, and most of it in 3 hours.

PEETERS, G., OYAERT, W., BOUCKAERT, J. & HAECK, H. (1958). **Acetylation of sulfanilamide in ketonaemic cows.**—*Zbl. VetMed.* **5,** 43-50. [In English. Summaries in French, Spanish and German. Authors' summary modified.] **3353**

Sulphanilamide was administered either by mouth or intraperitoneally to cows with ketosis and normal cows. The experimental animals were divided into different groups: normal lactating cows either starved or not; cows with ketosis treated with glucose intravenously, with glucose intravenously plus insulin i/m, or with prednisone, or without treatment. Urine produced during 6 hours was collected and measured.

Free and acetylated sulphonamide were determined in the urine. In this respect differences between groups of experimental animals were observed, the most striking being observed when the ratio of total to free sulphonamide was calculated. In ketosis the sulphonamide acetylating capacity was 15–20% lower than in normal cows, whether these were starved or not. This disturbance was improved by means of glucose and made completely normal by glucose plus insulin. Prednisone was not very effective. The authors suggested that in the liver of cows with ketosis the citric acid cycle is reduced, causing decreased acetate-activating mechanism. An intensified carbohydrate metabolism restores the normal capacity.

PICCOTIN, G. & ALBERTI, A. (1958). Osservazioni su alcune costanti ematiche in bovine con manifestazioni paraplegiche. **[Blood values in cattle with paraplegia.]**—*Clin. vet., Milano* **81,** 1-8. [Summary in English.] **3354**

The blood values of 20 cows with paraplegia, associated or not with parturition, were studied. The levels of inorganic and of total phosphorus and of calcium dropped; the chlorine and sodium values remained unaltered; there was irregular diminution of magnesium, total protein and alkaline reserve; the average Ca/P ratio was 1/3·25 in sick animals compared with 1/2·84 after recovery, while the Ca/Mg ratio was not affected.—T.E.G.R.

See also absts. **3084** (mastitis in cows fed legume-grass mixtures); **3458** (report, Gt Britain); **3467** (book, Congress Proceedings).

DISEASES, GENERAL

VAN HOOSEN, N. & ISHAM, R. R. (1958). **The therapeutic use of magnets given orally for traumatic gastritis.**—*J. Amer. vet. med. Ass.* **132,** 388-389. **3355**

In 1955, magnets were given orally to 50 adult cows. Traumatic reticulitis, which was formerly frequent in this herd, has not occurred since. 83 cows with signs of traumatic reticulitis were given a magnet together with an i/m injection of penicillin and streptomycin; 74 recovered. —M.G.G.

DOWNEY, N. E. (1957). **A preliminary investigation into the aetiology of enzootic pneumonia of sheep ("Southland pneumonia").**—*N. Z. vet. J.* **5,** 128-133. **3356**

The symptoms and pathology of this pneumonia have been described by Salisbury [*V.B.* **28,** 2267]. A preliminary investigation revealed that *Pasteurella haemolytica* was present in lesions. The presence of a virus was suspected, but transmission experiments using suspension of frozen lung, or chorio-allantoic membrane from chick embryos inoculated with lung suspension, yielded inconclusive results. D. concluded that the possibility of *Past. haemolytica* being the sole cause should not be discarded without further study of its pathogenicity. —R.M.

OSBORNE, H. G. (1958). **Ileal intussusception causing multiple losses in sheep.**—*Aust. vet. J.* **34,** 42-43. [Author's summary modified.] **3357**

Three outbreaks of ileal intussusception in sheep in New South Wales are reported. The cause is not known and although nodules of *Oesophagostomum columbianum* were present in all cases their aetiological significance is doubted. There may be some significance in the fact that in each case the sheep had recently travelled.

MULLINS, J., HARTLEY, W. J. & SALISBURY, R. M. (1958). **An outbreak of blindness (amaurosis) in sheep.**—*N. Z. vet. J.* **6,** 52-53. **3358**

Partially or completely blind animals were seen in a flock of 18-month-old hoggets. The first cases developed on the day after crutching, and fresh cases appeared for several days. Most of them commenced feeding again after a few

days and later regained their sight. Clinical examination revealed no abnormality in the eyes. P.M. examination of 3 slaughtered hoggets merely revealed numerous foci of non-inflammatory necrosis of neurones in the deeper layers of the cerebral cortex. A second outbreak affected 10% of a flock of 120 yearling hoggets on the day after shearing. One died; the remainder recovered after about a month.

—M.G.G.

GREGORY, D. W. (1958). **Edema disease (*E. coli* toxemia) of swine.**—*Vet. Med.* **53**, 77-81. **3359**

A report of an investigation into the serotypes of *Escherichia coli* isolated in 22 outbreaks of oedema disease of pigs. Eight O antigen groups were isolated, two of which were recovered from 70% of the cases. S/c inoculation of 2 ml. of a formolized culture of one antigenic group was made into 17 pigs, and later an oral challenge of these and 17 controls by the same antigenic group produced no disease, though of three deaths, one control and one inoculated animal died from oedema disease caused by a different antigenic group. Tests were also made to determine the sensitivity of the strains to various antibiotics and sulphonamides, and to detect the presence of serum agglutinins.—W. E. PARISH.

VAUGHAN, L. C. (1958). **Studies on intervertebral disc protrusion in the dog. I. Aetiology and pathogenesis.** — *Brit. vet. J.* **114**, 105-112. **3360**

Intervertebral disk protrusion in dogs plays an important role in the production of signs and symptoms varying from cervical and lumbar pain to paraplegia or even quadriplegia. The condition is commonest in middle-aged (5–6 years old) dogs of the chondrodystrophoid breeds (Dachshund, Pekinese, Spaniel). A tendency was observed for it to occur in bitches during oestrus and early pseudo-pregnancy. It is suggested that hormonal and hereditary influences may bring about degenerative changes in the disks. Myelographical studies revealed variations in the degree and extent of the inflammatory reaction caused by the protrusion. This may explain why the severity of the symptoms is not always correlated with the degree of compression of the spinal cord.—M.G.G.

KING, A. S. & SMITH, R. N. (1958). **Diseases of the intervertebral disk of the cat.**—*Nature, Lond.* **181**, 568-569. **3361**

Of 100 adult cats 26 had dorsal protrusions of the intervertebral disks, 91 disks being affected. Two types were distinguished: in one the protruded mass perforated the annulus fibrosus, and in the other it caused a bulge without passing right through the annulus. In 50 of the cats, the incidence of macroscopic degenerations other than dorsal protrusions was investigated. General disorganization of the disk, sometimes attaining almost complete destruction, was the commonest, being found in 27 cats, involving 178 disks. Ventral protrusions were found in 8 cats, and a lateral protrusion in one. Calcification was seen in 3, and 'brown degeneration' in 15. Dorsal protrusions were distributed chiefly amongst the cervical and lumbar vertebrae, whereas the highest incidence of general degenerations was between the second and eleventh thoracic vertebrae.—M.G.G.

I. CLARK, S. T. & MEIER, H. (1958). **A clinico-pathological study of thyroid disease in the dog and cat. Part I. Thyroid pathology.** — *Zbl. VetMed.* **5**, 17-32. **3362**

II. MEIER, H. & CLARK, S. T. (1958). **The clinico-pathological aspect of thyroid disease in the dog and cat. Part II. Clinical features.** —*Ibid.* 120-128. [In English. Summaries in French, German and Spanish. Authors' summaries modified.] **3363**

I. A histological survey of thyroid glands from all dogs and cats examined P.M. during six months and selective cases collected over 10 years indicated a high incidence of pathological lesions. These were classified, described, illustrated and analysed with reference to incidence.

Changes were associated with senescence, goitre, tumours, degeneration and inflammation. Degenerative and inflammatory lesions were rare as compared with goitre and tumours, the incidence of which increased with age. The wide variety of goitrous lesions was reflected in the patterns of tumours which probably followed goitre.

Thyroid lesions can only be considered absent after a complete gross and histological examination is carried out, since enlargement of the glands suggesting thyroid disease occurs in only a very low percentage of cases.

II. In view of its frequency care must be exercised in diagnosing thyroid disease because swelling of the gland is often absent.

In a limited number of cases, clinical thyroid dysfunction was independent of type and extent of the underlying pathological changes; the histological finding did not always bear out the expected functional disturbance.

Although pathological lesions which may cause functional disturbances increase in frequency with age, thyroid disease should not be

discounted in young animals showing related clinical signs.

The great number of tumours, some of which metastasized to the lung and other viscera (not to skeleton) and less frequently to the regional lymph nodes, was noteworthy. Most of them originated from normal-sized or not palpably enlarged thyroids; clinical signs of dysfunction were also lacking.

More than half of malignant thyroid tumours in both dogs and cats metastasized to the lungs. Metastatic tumours were in many cases detected by X-ray, there being no obvious primary site of origin. In differential diagnosis, the thyroid should be considered in addition to mammary, perianal and sweat glands, and skeleton (osteogenic sarcoma) as the source of metastatic lung tumours.

THOMPSON, S. W. (1958). **Leiomyometaplasts, particles of unknown significance in smooth muscle cells.**—*Amer. J. Path.* **34**, 273-283. [Author's summary.] **3364**

Particles of unknown significance were observed within intracytoplasmic vacuoles of hypertrophied smooth muscle cells of the duodenum in 3 dogs, and of the duodenum, spleen and bladder of a cat. Their characteristics were determined by a variety of staining techniques, histochemical tests and physical procedures and they were believed to constitute a distinct morphologic entity. It is suggested that they be designated leiomyometaplasts, a descriptive term which characterizes them as particles of lifeless matter or inclusions within the cytoplasm of smooth muscle cells.

ARCHER, R. K. & MILLER, W. C. (1958). **A brief review of blood coagulation and methods for the control of haemorrhage.**—*Vet. Rec.* **70**, 357-362. [Authors' summary modified.] **3365**

A general account is given of the mechanism of blood coagulation. The principal drugs and agents used for haemostasis are surveyed, and it is concluded that there is no therapeutic method available for rendering the circulating blood of normal animals hypercoagulable. Local haemorrhage can be controlled with absorbent sponge dressings preferably impregnated with Russell's viper venom or a thombin preparation. In certain pathological states with disorders of fat metabolism, a tendency to haemorrhagic diathesis can be prevented by vitamin K therapy. Vitamin K_1 (not water-soluble vitamin K analogue) is indicated for the treatment of the hypoprothrombinaemia caused by warfarin poisoning.

SCHNAPPAUF, H. (1958). Refraktometrische Bestimmung der Hämoglobinkonzentration von Rattenerythrozyten mit dem Phasenkontrastmikroskop. **[Refractometric determination of haemoglobin in rat erythrocytes with the phase contrast microscope.]** —*Zbl. VetMed.* **5**, 109-119. [Summaries in English, French and Spanish.] **3366**

The distribution of haemoglobin in rat erythrocytes was determined by the microrefractometric method of Barer. In preliminary experiments a suitable composition of the immersion fluid was determined and it was found that rat erythrocytes were particularly susceptible to variations in salt concentration. In 14 healthy rats the mean cellular haemoglobin was 31%. In 7 hypophysectomized rats the mean cellular haemoglobin concentration was lower than in intact rats but its dispersion was normal. The method provided an opportunity to study pathological changes in haemopoiesis.—R.M.

CUADRA, M. (1958). **Selenoid (crescent) bodies.** —*Blood* **13**, 258-265. [Summary in Interlingua. Author's summary modified.] **3367**

C. described an original method of staining selenoid (or crescent) bodies, and one which is suitable for morphological structural studies. The method is also suitable for staining stroma of r.b.c.

Selenoid bodies originate from r.b.c. and correspond to their stroma. Selenoid bodies can be produced *in vitro* by the spreading of blood on a slide. Two factors influence their formation: a mechanical factor by friction of the r.b.c. against the surface of the slide and a chemical essential factor represented by the lipids of the blood, increasing the fragility of the r.b.c.

The number of selenoid bodies in any smear of blood is directly proportional to its content of lipids, either from an exogenous source (alimentary lipaemia) or from an endogenous origin.

The author found selenoid bodies in the dog, sheep, rabbit, g.pig, rat and hen.

BROWN, D. G. (1958). **Acute irradiation sickness in farm animals.**—*Auburn Vet.* **14**, 88-91. **3368**

An account of work done at the Agricultural Research Lab. of Tennessee University at Oak Ridge on radiation sickness in donkeys, cattle, sheep and pigs. A wide variety of symptoms was observed, depending on the source and amount of radiation and variation between species, breeds and individuals. It was emphasized that no single lesion or symptom was specific for radiation sickness, but a combination of encephalitis, gastro-enteritis, aplastic anaemia, ulcera-

tive gingivitis and spontaneous haemorrhage was characteristic. Differentiation at P.M. examination from anthrax, blackleg and swine fever presented problems.—R.M.

EKMAN, L. (1958). **Metabolism of fission products in ruminants. 1. Excretion of strontium 90 in goats.**—*Nord. VetMed.* **10,** 245-254. [In English. Summaries in Swedish and German. Author's summary.] **3369**

Radiostrontium (Sr^{90}) was administered orally to 3 goats and the faecal, urinary and milk excretion during the following 3–4 months studied. It was found that the milk was contaminated during 4–6 weeks after the administration. The main excretion occurred with the faeces. The urinary excretion lasted about 3 weeks longer than the faecal.

TURNER, R. C., RADLEY, J. M. & MAYNEORD, W. V. (1958). **Alpha-ray activities of humans and their environment.**—*Nature, Lond.* **181,** 518-521. **3370**

The authors worked out simple methods for assessing the load of α-ray particles, and tested materials from man and certain domestic animals.

Body tissues particularly bone, contain small quantities of radioactive elements. To what extent they are derived from ingested substances is largely unknown. The knowledge of the radioactivity of our environment is very scanty; natural sources of irradiation exist of which we are ignorant. Although largely unknown these levels of radioactivity have been assumed to be of academic rather than practical importance, yet they form the only sure ground upon which the dangers of different levels may be argued. Since many of the naturally occurring radioactive nuclides emit α particles the authors considered that further search for such activities in the bodies of human beings and animals and in their environments was worthwhile.

Material from the humerus of a radium worker, who had ingested active material in the year 1910, revealed activity of $4{\cdot}70 \times 10^{-11}$g. radium-226 per g. wet bone. Material from the humerus of a worker who had ingested both radium and mesothorium 8–10 years earlier gave values of $5{\cdot}3 \times 10^{-12}$ c and $5{\cdot}9 \times 10^{-12}$ c/g. wet bone respectively. The breath and blood of a patient who was given "Thorotrast" 20 years previously, yielded an activity of $1{\cdot}5 \times 10^{-9}$ thoron per litre of the former and $3{\cdot}5 \times 10^{-12}$ c/cu. cm. of thorium B for the latter. These cases had radioactive burdens of perhaps 10,000 times the magnitude of those of the general population. In tests on bone from Cornwall, London and Cumberland there was great variation. Those from Cornwall had higher values than the others—the mean being $5{\cdot}0 \times 10^{-13}$ c per g. of bone ash, compared with $1{\cdot}7 \times 10^{-13}$ c for the London area.

The activity in bone of stillborn infants was surprisingly high (mean value $4{\cdot}5 \times 10^{-12}$ c per g. bone ash). In adult bone approx. 40% of the α activity is apparently due to the radiothorium series. For the 11 stillborn infants tested the mean fraction was the same.

In tests on milk from London the figure was $3{\cdot}1 \times 10^{-12}$ c/g. ash. This implies a total α content of 1·3μμc and a mean radium content of 0·22 μμc per pint. In a few months the intake in milk of the infant, if completely incorporated in the body, would provide most of the radium stored in the adult. A large fraction, however, appears to be excreted. The figures for two samples of human milk ash were $7{\cdot}9 \times 10^{-13}$ and $3{\cdot}1 \times 10^{-13}$ respectively. The activity was about evenly divided between radium and radiothorium.

Samples of bones of cows yielded α values ranging from $2{\cdot}0 \times 10^{-12}$ to $6{\cdot}0 \times 10^{-12}$ c/g. ash, with a mean of about ten times that for man. The α activity of the bone marrow was the same as for the bone; the richness in thorium was 2 : 1 that for radium. The mean activity of cow spleen was $1{\cdot}8 \times 10^{-12}$, with about equal parts of the thorium and radium series. The ratio of α activity in milk to that in bone was very different in human beings and cows, being at least ten times higher for the former.

The bones of sheep yielded values between 2 and 6×10^{-12} c per g. ash. The figures for pigs revealed very low activity. The figure for the bones of an 18-year-old horse was $3{\cdot}8 \times 10^{-13}$

There are evidently differences between the radioactive content of bones of various species, but it is not known whether these are determined by feeding habits.

Some tests were made on soils and fertilizers. Chalk was low in activity ($7–8 \times 10^{-13}$ c per g.). This is of great importance in the design of low-background laboratories. The next lowest were the limestones.

Activities were found in a number of substances in which thorium and rare earths are closely associated. Thorium often passes through chemical separation processes in company with materials like cerium. Lighter flint and cleaning materials involving cerium yielded figures of 3×10^{-9} and 4×10^{-10} c per g. respectively, and in one instance a pharmaceutical product which evidently contained a large percentage of thorium had a high yield.

To study the immediate sources of radio-

activity in man a "balance" experiment was done on a normal four-year-old boy. Samples of every food eaten over a period of a month were assayed and also each day a sample of faeces. The main conclusions from this experiment were:– food was the important factor in determining the daily intake of radioactive material and completely overshadowed milk and water; the levels of activity in foodstuffs were extremely variable, but in general high values were obtained from cereals and flours, particularly those from whole wheat. Other factors relating to intake and excretion were noted.

—W.A.P.

BECKETT, E. B. & BOURNE, G. H. (1957). **Some histochemical observations on human dystrophic muscle.**—*Science* **126,** 357-358. **3371**

The authors reported on biopsy material from muscle from 32 patients with muscular dystrophies and other muscular diseases.

Succinic dehydrogenase activity varied considerably between different control muscle preparations and between individual fibres in any one muscle and it varied independently of the cytochrome oxidase reaction.

In pathological muscle there was a decrease in the activity of succinic dehydrogenase, indicating a lowering of the aerobic metabolism.

There was little decrease of cholinesterase activity in dystrophic muscle, but where there was considerable replacement of muscle by connective tissue, there were isolated apparently intact end-plates attached to remnants of muscle fibres which gave a normal cholinesterase reaction. In atrophying muscle fibres there was a strong positive reaction in the muscle substance itself.

Little evidence was found that muscular dystrophy and related diseases were associated with either physical or enzymic breakdown of neuromuscular transmission.

In atrophy of muscle fibres and replacement by connective tissue, the latter gave a strong 5-nucleotidase reaction and appeared to be invading and destroying the muscle fibres. Adenosine monophosphate is dephosphorylated by 5-nucleotidase, so this result may be of significance. Inhibitors of 5-nucleotidase may be of use in treatment, also the anti-snake venom serum prepared from venom containing 5-nucleotidase.

Acid phosphatase is increased in atrophied fibres; with replacement of muscle fibres by connective tissue the invading cells show a high level of acid phosphatase activity.

Alkaline phosphatase is present only in the capillaries and intima of larger vessels of normal muscle, but it appears occasionally in atrophying muscles fibres and in connective tissue fibres surrounding them.

The increase of phosphatase activity (including 5-nucleotidase) in the connective tissue of dystrophic muscles suggested that phosphatases may play an important part in the destruction of muscle fibres in these diseases. They may not be directly concerned with the breakdown of muscle substance, but they may cause functional failure through excessive breakdown of high-energy phosphate compounds, and a similar process may be involved in aging.—W.A.P.

PRYSE-DAVIES, J. & WILKINSON, J. H. (1958). **Diagnostic value of serum-transaminase activity in hepatic and gastrointestinal diseases.**—*Lancet* June 14th, pp. 1249-1253. [Authors' summary.] **3372**

The precision and sensitivity of the spectrophotometric method of determining serum glutamic oxaloacetic transaminase (S.G.O.T.) and glutamic pyruvic transaminase (S.G.P.T.) has been improved by the application of temperature corrections.

A study of 50 healthy people and 127 patients in whom no rise in transminase levels was expected led to the conclusion that values exceeding S.G.O.T. 40 and S.G.P.T. 30 units per ml. should be regarded as abnormal. In an investigation embracing a wide range of liver and gastrointestinal diseases it was confirmed that high values (over 500 units per ml.) for both enzymes are characteristic of infective hepatitis and carbon-tetrachloride poisoning. Moderately raised values (100–300 units per ml.) occur in obstructive jaundice, glandular--fever hepatitis, and toxic hepatitis (excluding that due to carbon tetrachloride). Variable results were obtained in cirrhosis and liver metastases, but in 64% the S.G.O.T. level was raised above normal values, whereas only about 40% showed increased S.G.P.T. activity.

Normal values were obtained in gastrointestinal diseases not involving the liver. S.G.O.T. showed a moderate and transient rise (up to 300 units per ml.) in myocardial infarction, but in this condition the S.G.P.T. level usually remained normal. S.G.P.T. was thus of considerable value in confirming the hepatic origin of S.G.O.T. in certain cases. Used critically in conjunction with other liver-function tests, transaminase determinations were extremely useful.

INNES, J. R. M. & SAUNDERS, L. Z. (1957). **Diseases of the central nervous system of domesticated animals and comparisons with human neuropathology.** In "Advances in

veterinary science" Vol. III. pp. 33-196. [New York (& London): Academic Press Inc.] **3373**

This review covering disorders of the c.n.s. is based on personal studies over the years rather than on "recent advances" alone. The emphasis is on pathology in its widest sense, a study of cause and effect together with the field history and clinical signs. There is a considerable gap in veterinary neurology concerning the correlation of clinical findings with pathology as a result of all too frequent lack of thorough examination of the brain and spinal cord in routine P.M. examinations. Consequently classification of many animal diseases showing neurological signs is somewhat arbitrary. Inherited diseases considered include cerebellar aplasia, agenesis and olivopontocerebellar atrophy (puppies, kittens, pigs), cerebellar hypoplasia in calves, and cerebellar atrophy in lambs, whilst specific inherited neurological diseases discussed include spinal muscular atrophy in dogs, myotonia congenita (Thomsen's disease) in goats, trembles and myoclonia congenita in pigs, "bulldog" calves and hydrocephalus, hereditary bovine ataxia, congenital posterior paralysis in calves, spastic paresis in Holstein–Friesian cattle, a periodic spastic syndrome of cattle, epilepsy, congenital deafness in white animals and posterior paralysis in pigs. The encephalomyelitides have been arbitrarily divided into broad categories which are a mixed group partly based on cause and on reaction. The types of demyelinating (myelinoclastic) encephalomyelitis discussed include Schilder's-like disease in apes and monkeys, swayback in lambs, acute epizootic leucoencephalitis in horses, equine "wobbles," pseudoamyloid multiradicular degeneration in Shetland ponies, and spontaneous disseminated encephalomyelitis in mice. Encephalo- and myelo-malacias considered include focal symmetrical spinal poliomalacia in sheep (Kenya), nigropallidal malacia in horses (California) due to either yellow star thistle poisoning or a nutritional deficiency conditioned by the intake of a poisonous plant, and focal symmetrical encephalomyelitis in lambs seen in New Zealand in areas where enterotoxaemia due to *Clostridium welchii* Type D toxin had occurred. A polioencephalomalacia, also probably the result of an intoxication from feed, has been seen in Colorado and Wyoming amongst sheep and cattle. Viral encephalomyelitides considered include louping-ill in sheep which for the production of the full encephalitis is associated with tick-borne fever, "visna" in sheep (Iceland)—a slow rather than a chronic viral infection, and the porcine encephalitides. These are discussed from the standpoint of the value of neuropathological lesions in the diagnosis of swine fever, the identification of the aetiology in cases where histological lesions of encephalitis have been found, and the neuropathology of Teschen disease. The canine encephalo-myelopathies include a number of specific pathological entities caused by different agents. Actinomycosis, leptospirosis, glanders and psittacoid, mycotic and helminthic infections can spread by devious routes to involve the brain. Postvaccinal encephalitis occurring in dogs following anti-rabies vaccination and experimental allergic encephalitis in various animals following injection of brain adjuvant emulsions are discussed and the transplacental viral complications associated with swine fever, Japanese B encephalitis and bluetongue vaccination. Nutritional conditions, intoxications and tumours which produce neurological disorders are reviewed whilst amongst the miscellaneous neurological conditions considered are scrapie, lipid dystrophy of the c.n.s. in dogs, acute amaurotic epilepsy in monkeys, neuromuscular disturbance in Scottish Terriers, and neuritis of the cauda equina in horses.

—A. Ackroyd.

See also absts. **3349, 3351, 3352, 3353,** (ketosis); **3354** (paraplegia); **3428** (Windscale accident); **3458** (report, Gt. Britain); **3459** (report, New Zealand); **3461** (report, Belgian Congo); **3466** (book, pathology of reproduction); **3467** (book, Congress Proceedings).

POISONS AND POISONING

Stewart, G. A. & Merilan, C. P. (1958). **Effect of potassium nitrate intake on lactating dairy cows.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 650. pp. 11. **3374**

Administration of KNO_3 to lactating dairy cows resulted in a decrease in milk production and an increase in methaemoglobin, which varied according to the dosage. It apparently had no adverse effect on milk composition (butterfat, total solids, solids-not-fat and chlorides). One cow died after ingesting 0·55 g. KNO_3/kg. body wt. daily for three days.—R.M.

Bentz, H. (1958). Rindervergiftungen durch Holzschutzmassnahmen. **[Poisoning of cattle with wood preservatives.]** — *Dtsch. tierärztl. Wschr.* **65,** 42-43. **3375**

Incidents are described in which cattle were severely poisoned through eating fabric, soaked in preservative, protecting the bases of wooden

telegraph poles. Samples of preservatives and stomach contents contained fluorine and phenols, and in one case arsenic.—M.G.G.

PUDELKIEWICZ, W. J., BOUCHER, R. V., CALLENBACH, E. W. & MILLER, R. C. (1958). **Some physiological responses of Broad Breasted Bronze poults to chlorinated naphthalene.**—*Poult. Sci.* **37,** 185-187. **3376**

A mixture of penta- and hexachloronaphthalenes, as 20 p.p.m. in the diet, caused 50% mortality and reduced growth in poults, whereas a diet containing 125 p.p.m. of octachloronaphthalene had no effect. The lack of toxicity of the more highly chlorinated substance may be due to its high melting point and low solubility. —M.G.G.

OPPENHEIMER, E. H. (1958). **A note on the difference between the susceptibility of the liver of the hen and rooster to carbon tetrachloride poisoning.**—*Bull. Johns Hopk. Hosp.* **102,** 313-319. **3377**

Cocks were given from 1 to 5 weekly injections of CCl_4 at 10 ml./kg. body wt. by s/c inj. When killed 48 hours after the final injection neither necrosis nor fatty change was found in the liver. About half the hens similarly treated developed fatty change, but there was no necrosis in the liver. Some birds developed severe cellulitis with necrosis of skin and muscle at the site of injection. It was suggested that the higher blood cholesterol level of hens made them more susceptible to injury by the drug than cocks.—R.M.

STAPLES, E. L. J., RUSSELL, R. R. & SALISBURY, R. M. (1958). **A toxic calf meal.** — *N. Z. vet. J.* **6,** 33-40. **3378**

Hyperaesthesia and ataxia were reported in calves and dogs fed a commercial calf meal. Similar symptoms, followed by death, occurred in week-old calves fed the meal experimentally. A bacillus, closely related to *Bacillus megatherium* and *B. cereus,* was isolated from the meal. Cultures of this bacillus caused the same symptoms, sometimes with death, when given to young g.pigs s/c and to calves s/c or by stomach tube, unweaned animals being much more susceptible than weaned animals.—M.G.G.

SCHMITTLE, S. C., EDWARDS, H. M. & MORRIS, D. (1958). **A disorder of chickens probably due to a toxic feed—preliminary report.**—*J. Amer. vet. med. Ass.* **132,** 216-219. **3379**

A condition of broiler chickens characterized by laboured breathing and high mortality is described. P.M. findings include marked hydropericardium, enlarged liver with roughened surface, hydroperitoneum and swollen pale kidneys. No primary infectious agent could be isolated. In one field trial meal suspected to be the cause of the conditon was fed to 1,200 birds, 86% of which died in about three weeks.

In laboratory feeding trials with small groups of birds fed a variety of rations, those fed on the suspected meals had the highest mortality. P.M. findings resembled those in the field outbreaks; the livers were enlarged, mottled and in advanced cases had roughened surfaces but no cirrhosis. Haemorrhages were found in the skeletal muscles of some birds.

There were indications that the toxic factor was present in the fat of the diet.

—W. E. PARISH.

NOVARA, V. (1958). Avvelenamento naturale da oleandro (*Nerium oleander*) nei bovini. **[Oleander poisoning in cattle.]**—*Vet. ital.* **9,** 18-24. [Summaries in English, French and German.] **3380**

Oleander poisoning in two calves is described. Clinical manifestations included dulness, impaired or absent reflexes, meiosis, slow arrhythmic pulse, laboured abdominal respiration, anorexia, salivation, cessation of rumination, tympany and intestinal stasis. Haemorrhages in the epicardium and endocardium were observed at P.M. examination. One of the calves died and the other responded to treatment with 5% glucose soln. i/v and animal charcoal by the mouth.—T.E.G.R.

CASTELLA BELTRÁN, E. (1957). Una enfermedad no descrita: la intoxicación producida por el castaño. **[Poisoning of cattle with chestnut leaves.]**—*Rev. Patronato Biol. anim., Madrid* **3,** 237-252. [Summary in English.] **3381**

Poisoning with leaves of the sweet chestnut tree, *Castanea sativa,* is described. Cattle are affected. The course is chronic and characterized chiefly by haemoglobinuria. There is also enteritis, constipation, a fall in milk yield, anaemia and weakness. Poisoned animals develop a strong appetite for the plant. Lesions are found in the kidney, intestine, and liver. There is no mortality, and recovery is rapid. It is to be differentiated from acorn and oak leaf poisoning, in which the symptoms are predominantly intestinal and are acute.—M.G.G.

HUTTON, E. M., WINDRUM, G. M. & KRATZING, C. C. (1958). **Studies on the toxicity of *Indigofera endecaphylla.* I. Toxicity for rabbits.**—*J. Nutr.* **64,** 321-337. [Authors' summary.] **3382**

Rabbits fed green leaf, dried leaf or seed of *I. endecaphylla* develop severe liver damage. Nitropropionic acid could not be detected in the seed though it is present in the leaf. Leaf of two strains of *I. endecaphylla* each contained twice the amount of β-nitropropionic acid of the other strain used. This difference had no effect on the liver damage induced by feeding the three strains. Synthetic β-nitropropionic acid is not toxic to rabbit liver when force fed in amounts comparable to that in the green leaf.

It appears that the toxin of *Indigofera endecaphylla* is not nitropropionic acid.

TATRISHVILI, P. S. (1957). **[Pathology of experimental *Claviceps paspalum* poisoning in livestock.]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **20**, 226-237. [In Russian.] **3383**

Two cows, 7 calves, 8 young pigs, a horse and 2 donkeys were poisoned by oral administration of an aqueous suspension of sclerotia of *C. paspali* at doses ranging from 2 to 6 g./kg. body wt. Horses and donkeys seemed to be most susceptible to poisoning and pigs least. Symptoms first appeared between 2–3 hours (horses) and 5–8 days (pigs) after administration of toxin; they consisted of initial transient depression, then rapidly changing signs of increased reflex stimulation of the c.n.s. with disturbances in coordination of movements, convulsions and general paralysis, terminating in death. It was concluded that the toxin was a neurotropic poison, having greatest effect on the c.n.s. The most severe structural changes were found in the brain, and the next most severe in cerebellum and spinal cord (11 photomicrographs). The lesions in the c.n.s. were characterized by circulatory disturbances and dystrophic changes in neurones and glial cells.—R.M.

GRAY, J. E. & PURMALIS, A. (1958). **The acute toxicity of procaine penicillin G and of dihydrostreptomycin sulfate in the pigeon and the chicken.** — *Avian Diseases* **2**, 187-196. [Authors' summary modified.] **3384**

Acute poisoning of pigeons with dihydrostreptomycin sulphate was characterized by ataxic and depressive stages. The intramuscular LD_{50} was 715 mg./kg.

An intramuscular dose of 2,500,000 units per kg. of procaine penicillin G caused opisthotonic spasm in two pigeons. The LD_{50} was 1,750,000 units/kg.

The proneness of pigeons to emesis was considered to be of relatively non-specific toxicological significance.

In fowls the signs of acute poisoning with dihydrostreptomycin sulphate were similar to those in the pigeon. The i/m LD_{50} was 2·17 g./kg.

Intramuscular injections of 40,000 units per kg. and higher of procaine penicillin G produced watery diarrhoea in chickens. The LD_{50} was more than 2,500,000 units/kg.

COX, D. H. & BAKER, B. R. (1958). **A diagnostic test for organic phosphate insecticidal poisoning of cattle.**—*J. Amer. vet. med. Ass.* **132**, 385-387. [Authors' summary modified.] **3385**

A simple and rapid colorimetric test for blood cholinesterase is described as an aid, in conjunction with signs and history, in the diagnosis of poisoning by organic phosphate insecticides in cattle.

THAMM, H. (1958). Experimentelle Prüfung der Einwirkungen von Phosphorsäureester (Wofatox) auf Rinder und Schweine. **[Toxicity of the phosphoric acid ester contact insecticide "Wofatox" for cattle and pigs.]**—*Mh. VetMed.* **13**, 193-201. **3386**

Cattle and pigs could not be poisoned with large doses of di-methyl-paranitrophenyl-thiophosphoric acid ester by administration in the food or water, as this was consumed only after the preparation had begun to decompose. The oral lethal dose for cattle was about 100 mg. per kg. body wt. When administered as an aerosol, an estimated dose of 1 mg./kg. body wt. was sufficient to cause symptoms in 2 pigs and a heifer. The carcasses of pigs slaughtered 6 weeks after administration of the insecticide in the food had a characteristic odour.—M.G.G.

DAVICH, T. B., TOMBES, A. S. & CARTER, R. H. (1957). **Insecticide control of green June beetle larvae attacking Ladino clover pastures: residues on foliage and accumulation in swine tissue.**—*J. econ. Ent.* **50**, 96-100. **3387**

Various tissues were obtained from pigs which had grazed for extended periods on Ladino clover or Ladino clover–orchard grass pastures treated with granulated insecticide formulations. Aldrin up to 14·8 lb. per acre failed to result in accumulation of measurable residues when analysis was based on the specific procedure. The analysis based on organic chlorine, and the specific analysis for dieldrin, showed toxicants had accumulated in the fat obtained from pigs which had grazed aldrin-treated pastures. Increasing amounts of toxicant were found as the aldrin dosage was increased. Fat tissue from pigs which had grazed pastures treated with 1·7 and 3·9 lb. of dieldrin per acre accumu-

lated measurable residues when analysed either by the specific method or by the organic chlorine method. Heptachlor, applied at 3·6 lb. per acre, and toxaphene, applied at 16·0 lb. per acre, accumulated in pig fat at levels of 0·9 and 1·0 p.p.m. respectively.—R.M.

See also absts. **3373** (e.n.s.); **3428** (Windscale accident); **3458** (report, Gt. Britain); **3459** (report, New Zealand).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

EGER, W., GERICKE, D. & JUNGMICHEL, H. (1958). Der Einfluss des Omnadin auf die Resistenz des Organismus im Allylalkohol- und Bakterizidie-Test. [**Influence of "Omnadin" on resistance of the body as judged by the allyl alcohol and bactericidal tests.**]—*Arzneimittelforsch.* **8**, 147-150. [Summary in English.] **3388**

It was claimed that "Omnadin" induced a temporary increase in resistance of the body to damage by allyl alcohol, and a significant increase in bactericidal activity of the serum. In both cases the optimal increase occurred 8–16 hours after s/c injection.—R.M.

HAMMER, D. (1958). Diffusionsverhältnisse zwischen Blut und Synovialflüssigkeit beim Kalb nach Applikation von Antibiotika. [**Diffusion between blood and synovial fluid in calves after administration of antibiotics.**]—*Mh. Tierheilk.* **10**, 2-13. **3389**

74 calves were given i/v or i/m injections of various antibiotics, viz. potassium penicillin, procaine penicillin, tetracycline, chloramphenicol and erythromycin. Concentrations of these were assayed in synovial fluid at intervals after injection and were found to be determined largely by the dosage and the route of application. Acute pneumococcal arthritis responded particularly well when treated by the i/m or i/v route, and penicillin and erythromycin proved particularly useful here.—G. P. MARSHALL.

GOUGE, H. E., ELLIOTT, R. F. & VAN ROEKEL, O. K. (1958). **Effect of chlortetracycline on incidence of cervical abscesses and weight gains of swine.**—*J. Anim. Sci.* **17**, 34-41. **3390**

The incidence of cervical abscesses in 418 pigs from farms where this condition had been a recurring problem was significantly reduced, and weight gain and feed efficiency increased, by adding chlortetracycline to the basal ration at the rate of 50 g./ton, from weaning to marketing. Results were less good where the rate was decreased to 20 g./ton after 75 lb. body wt. had been reached. No advantage was gained by raising the rate of 100 g./ton.

—G. P. MARSHALL.

HOBBY, G. L. & LENERT, T. F. (1958). **Observations on the mode of action of oleandomycin.**—*Antibiot. & Chemother.* **8**, 219-227. [Authors' summary modified.] **3391**

Oleandomycin, on contact with susceptible micro-organisms, promptly inhibits microbial cell multiplication. It causes a decrease in the number of culturable cells within a given population, however, only after five to seven hours of contact. It is most active as a bactericidal agent following the period during which cell multiplication in the absence of the drug occurs most rapidly. The data presented suggest, but fail to establish conclusively, that cell multiplication is essential to the action of oleandomycin.

HAGEN, K. W., JR. (1958). **The effects of continuous sulfaquinoxaline feeding on rabbit mortality.**—*Amer. J. vet. Res.* **19**, 494-496. [Author's summary modified.] **3392**

A ration containing 0·025% of sulphaquinoxaline was fed continuously to 20 does and 367 young for a year. No toxic effects were noticed in any of the animals. At this level, the ration was palatable as indicated by the average weights of the weaned young.

The sulphaquinoxaline had no effect on the mortality caused by enteritis, but the haemorrhagic type of enteritis was 70% less than that in the control lot. The sulphonamide eliminated deaths caused by primary pneumonia and reduced the number of *Past. septica* isolations by 70%. The enteritis–pneumonia complex was not altered, but *Pasteurella* was isolated on fewer occasions.

HALL, L. W. (1957). **Anesthesiology.** In "Advances in veterinary science" Vol. III. pp. 1-32. [New York (& London): Academic Press Inc.] **3393**

The most significant advance in veterinary anaesthesia is the widespread adoption of "balanced methods" implying a synergic combination of premedication, general anaesthesia and local anaesthesia. The drugs most used for premedication are pethidine hydrochloride for all animal species; chlorpromazine, which has sedative properties and blocks autonomic re-

flexes under anaesthesia; the barbiturate drugs; and, for dogs, morphine. The three effects involved in anaesthesia (narcosis, analgesia, relaxation) can be produced independently of each other as required. Agents used to produce narcosis in veterinary surgery include chloral hydrate and β-naphthoxyethanol in particular for horses, pentobarbital sodium for pigs, pentothal sodium for all species, and the inhalational anaesthesics of which ether is still the most widely used. Relaxation drugs which include the curarizing agents, depolarizing agents and mephenesin have had little veterinary use largely because of the necessity of having available facilities for immediate artificial respiration. Agents commonly used to produce the analgesic element during the maintenance of anaesthesia are nitrous oxide, trichlorethylene, and pethidine, or local anaesthesics. Hypotensive methods (arteriotomy, spinal nerve block or blockade of autonomic ganglion) and hypothermia have not yet been used in veterinary surgery.

—A. Ackroyd.

Hansson, C.-H. (1958). **Studies on the effect of succinylcholine in domestic animals.** — *Nord. VetMed.* **10,** 201-216. [In English. Summaries in Swedish and German. Author's summary modified.] **3394**

The effect of succinylcholine on a neuromuscular preparation, blood pressure, pulse frequency and respiration in the horse, cow, pig and dog was studied. The minimal dose of succinylcholine giving complete neuro-muscular block was determined.

Horses and pigs were considerably less sensitive to succinylcholine than the other two species. There were only small differences in sensitivity to succinylcholie between young and adult animals.

Bester, J. F. (1957). **A study of the potentiation of pentobarbital anesthesia by glucose and its metabolites.**—*Dissertation, Ohio State Univ.* pp. 119. [Abst. from abst. in *Diss. Abstr.* **17,** 2633-2636.] **3395**

Glucose prolongs the sleeping time induced by pentobarbitone in rats. Upon recovery from pentobarbitone anaesthesia, rats are returned to sleep by the injection of concentrated solutions of glucose.

The blood level of pentobarbitone becomes higher if glucose is simultaneously given than if the drug is given alone. The liver does not remove pentobarbitone from the blood with normal rapidity if glucose is present in excess. The level of pentobarbitone in the brain increases slightly above normal if glucose is given with the barbiturate. The liver appears to be unable to polymerize glycogen and detoxify pentobarbitone simultaneously as rapidly as it can do either separately.—R.M.

See also absts. **3079** (penicillin); **3083** (antibiotics); **3085** (relationship between chemotherapy and immunity); **3090** (isoniazid-antibiotic treatment in TB.); **3117** (chloramphenicol in calf diarrhoea); **3124, 3125** (antibiotics, furazolidone in S. pullorum infection); **3160** (chlorpromazine and barbiturates in tetanus); **3163** (foot rot); **3165** (synnematin B); **3166** (antibiotics in poultry diseases); **3178** (sulphonamides in PPLO infection); **3188-3190** (antibiotics and nitrofurans in infectious sinusitis of turkeys); **3195** (trypanosomiasis); **3198** (trichomonas infecion); **3200** (coccidiosis); **3234** (urotropin for papillomata in dogs); **3253** (avian infecitous hepatitis); **3267** (Eomenacanthus stramineus); **3268** (warbles); **3269** (fly strike); **3270** (biting flies); **3271** (Glossina morsitans); **3272** (carbamoyl alkyl phosphorodithioates-insecticides); **3273** (BHC); **3277** (malathion); **3283, 3284** (lungworms); **3285** (thelazia); **3287** (CCl_4); **3289** (anthelmintics, "Neguvon"); **3290** (anthelmintics); **3346** (action of oral antidiabetic drugs); **3351, 3352** (sodium propionate in ketosis); **3384** (toxicity of antibiotics for fowls and pigeons); **3460** (report, Nyasaland); **3467** (book, Congress proceedings).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

I. Ragsdale, A. C., Chu Shan Cheng & Johnson, H. D. (1957). **Environmental physiology and shelter engineering. With special reference to domestic animals. XLII. Effects of constant environmental temperatures of 50°F and 80°F on the growth responses of Brahman, Santa Gertrudis, and Shorthorn calves.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 642. pp. 32. **3396**

II. Kibler, H. H. (1957). **Environmental physiology and shelter engineering. With special reference to domestic animals. XLIII. Energy metabolism and cardio-respiratory activities in Shorthorn, Santa Gertrudis, and Brahman heifers during growth at 50° and 80°F temperatures.** — *Ibid.* No. 643. pp. 32. **3397**

III. Yeck, R. G. (1957). **Environmental physiology and shelter engineering. With special reference to domestic animals. XLIV. Stable heat and moisture dissipation with beef calves at temperatures of 50° and 80°F.** — *Ibid.* No. 645. pp. 28. **3398**

IV. Johnson, H. D., Ragsdale, A. C. & Chu Shan Cheng. (1957). **Environmental physiology and shelter engineering. With special reference to domestic animals. XLV. Comparison of the effects of environmental temperatures on rabbits and cattle. Part 1—Influence of constant environmental temperatures (50° and 80°F.) on the growth responses and physiological reactions of rabbits and cattle.** —*Ibid.* No. 646. pp. 52. [Authors' summaries modified.] **3399**

I. A 16-month investigation was conducted to determine the influence of constant environmental temperatures of 50° and 80°F. and those occurring naturally in an open shed (exposed to Missouri diurnal and climatic changes) on growth of zebu, Santa Gertrudis (zebu–Shorthorn cross), and Shorthorn calves.

The physical measurements indicate that both the zebu and Santa Gertrudis grew well at 80°F., whereas the less heat-tolerant Shorthorns made relatively poor growth: at 16 months of age the Shorthorns lagged behind the other breeds by about 200 lb. in body wt. At 50°F. and in the open shed all breeds made apparently "normal" growth, with the exception that the zebu did not do quite as well at 50° as at 80°F.

The high productive response of the Santa Gertrudis at all the environments studied indicate they have inherited the combination of high heat-tolerance characteristics of the zebu and the high production characteristics of the Shorthorns.

II. Zebu, Santa Gertrudis, and Shorthorn female calves were reared in three groups at 50°, 80°F., and outdoor temperatures. Measurements made from 2 to 16 months of age on three animals of each breed in each group included energy metabolism, pulmonary ventilation rate, respiration rate, pulse rate, rectal temp. oxygen consumption, carbon dioxide production and methane production.

Age changes in the group exposed to outdoor temperatures were masked by seasonal temperature effects. In the groups reared at 50° and 80°F. changes with age were evident in pulse rate, energy metabolism and rectal temp.

The zebu and Santa Gertrudis breeds proved to be quite tolerant to all three temperatures as indicated by their rectal temp. and respiration rates. The Shorthorns growing at 50°F. and at outdoor temperatures did well, but those at 80°F. experienced constant physical strain (rectal temp. about 104°F. and respiration rate about 90).

Breed differences in heat tolerance were found to be inversely related to heat production per unit surface area and per unit weight. The zebu had the lowest rate of heat production and was most heat-tolerant. Shorthorns had the highest rate of heat production and were least heat-tolerant while Santa Gertrudis cattle were intermediate in both respects. Basal metabolism measurements at 65°F. confirmed the inverse relationship between heat production and heat tolerance. Measurement of rectal temp. during short exposures to 90° to 110°F. indicated the order of heat tolerance to be: Zebu, Santa Gertrudis, Shorthorn.

III. Ventilation and air-conditioning data for penned beef calves and their bedded area were determined with stable temperatures of 50° and 80°F. Both stable moisture (latent heat) and stable heat (latent plus sensible) were determined. They were found to increase with advancing age. The rate of increase was greatest during the first three months of age.

Most analyses were made on a unit weight basis to compensate for weight variation among the test animals. Both stable heat and stable moisture then became a decreasing function with respect to advancing calf age.

Stable heat was practically the same at both 50° and 80°F. However, stable moisture at 50°F. was only 50 to 60% of that at 80°F. The ratio of latent to total heat ranged from 35 to 39% at 50°F. and 67 to 71% at 80°F.

Accumulated litter increased stable heat and moisture. At 80°F. the stable heat and stable moisture were 20% greater on the sixth day after cleaning than they were on the first day after cleaning. An air temp. of 50°F. reduced this effect by about half.

Estimates were made of stable heat and the stable moisture dissipation for each of the three breeds tested (Shorthorn, Zebu, and Santa Gertrudis). On the basis of unit weight, the highest values were obtained before 20 weeks of age. Thereafter the values dropped sharply for several weeks and after 45 weeks began levelling off to a fixed value at 60 weeks which was much the same as with mature animals. An air temp. of 80°F. increased bedding requirements and litter production by about 50% above the values obtained at 50°F.

IV. Growth and development were primarily dependent upon the ease with which rabbits and calves could dissipate their body heat. This was clearly shown by evaporative cooling and rectal temp. However, the level of heat production is equally important, since greater heat production merely means a greater amount of heat dissipation is necessary.

Body weight gains were less in the Shorthorn cattle and rabbits reared at 80° and 83°F., respectively, as compared to those reared at 50° or 48°F. Less difference was noted between the zebu and Santa Gertrudis reared at 50° and 80°F. Thyroid activity of both species, per animal and unit weight, was lower at the high (80° or 83°F.) environmental temperature.

Pulse rate declined in both species with advancing age. However, there was an apparent species difference—the rabbit's pulse was higher at 83° than at 48°F., whereas that of calves was lower at 80° than at 50°F.

Feed consumption in both species increased

per animal with advancing age, but declined when expressed by unit weight. A greater feed consumption per unit weight was observed in both species at 48° and 50°F. An enormous difference in evaporative cooling was observed during growth between the calves at 50° and 80°F., whereas little difference existed between rabbits at the two environments. As in water consumption, evaporative cooling was higher in both species per unit weight at 80° and 83°F.

APPLEMAN, R. D. & DELOUCHE, J. C. (1958). **Behavioral, physiological and biochemical responses of goats to temperature, 0° to 40°C.** —*J. Anim. Sci.* **17,** 326-335. [Authors' summary modified.] **3400**

Decreasing the environmental temperature from 20° to 0°C. resulted in an increase in time spent consuming roughage; a slight decrease in water consumption, drinking frequency and time spent drinking; a considerable increase in re-mastication rate except in the 0°C. environment when the rate dropped to a level comparable to that of 20°C.; increase in aggressiveness, time spent standing, and movement, a 1°F. drop in rectal temp., a slight depression in respiration rate and a dramatic rise in pulse rate; and no appreciable change in haematocrit, or specific gravity of plasma and whole blood, but a decrease in plasma chloride.

Increasing the temp. from 20° to 40°C. resulted in a decrease in time spent consuming roughage; an increase in water consumption, drinking frequency and time spent drinking except for a pronounced decrease in each at 40°C.; no apparent change in either plasma or whole blood specific gravity, but a suggestion of lowered haematocrit values; and a decrease in plasma chlorides and an increase in plasma protein.

It was found that the limit of heat tolerance for the goats lay between 35° and 40°C. Failure of the heat regulatory system occurred at 40°C. The cold tolerance limits were not approached even when the temp. was lowered to 0°C. for 12 days.

ALEXANDER, G. & MCCANCE, I. (1958). **Temperature regulation in the new-born lamb. 1. Changes in rectal temperature within the first six hours of life.**—*Aust. J. agric. Res.* **9,** 339-347. [Authors' summary modified.] **3401**

Changes in rectal temperature during the first 6 hours of life of lambs born under adverse weather conditions are described. The rectal temp. of lambs at birth was slightly above that of the ewe. The subsequent changes varied from zero to a fall of 11°C. within 30 min. of birth. Temperature usually fell by 2° or 3°C. during the first hour and commenced to rise again even though the coat was still wet. It had returned to 39° to 40°C. by 3 hours after birth in most lambs. In some the temp. continued to fall until death. There was a significant inverse relationship between birth weight and rate of cooling. Cooling was more pronounced in twins than in single lambs, and in lambs that subsequently died than in lambs that survived. In two series of observations, undernutrition of the pregnant ewe resulted in the birth of lambs that appeared to cool more rapidly than lambs from well-fed ewes. The possible mechanism of the changes observed is discussed, together with practical implications of the observations.

HAMDY, A. H. & WEAVER, C. R. (1958). **Body temperature of young lambs.** —*Amer. J. Physiol.* **193,** 539-540. **3402**

Body temp. of 37 Merino and Shropshire lambs was recorded for the first hundred days of life. In both breeds it averaged 102·8°F. (range 100·2–104·4°). There was no relationship between body temp. and environmental temp. —R.M.

PATEL, U. G. & ANDERSON, D. W. (1958). **Variation of skin thickness in dairy cattle.**—*Emp. J. exp. Agric.* **26,** 18-24. [Authors' summary modified.] **3403**

A study of skin-fold thickness of 313 animals of various ages is presented. The mean skin thickness corrected to an age of 2 years varied from 0·224 in. on the elbow, for a group of mixed breeding, to 0·449 in. at the end of the last rib, for Friesians. The intra-class correlation of skin thicknesses at five different places on the same animal was 0·65. Differences beween skin thickness on the different body parts were highly significant.

There was marked association of the skin thickness with age and with weight, the relationship being curvilinear in both cases.

Friesians had slightly thicker skin than Ayrshires or the other breeds studied. Skin thickness on the point of the last rib was relatively more variable than on the other body parts. There are indications of genetic variation in skin thickness on all parts.

SHORT, B. F., FRASER, A. S. & CARTER, H. B. (1958). **Effect of level of feeding on the variability of fibre diameter in four breeds of sheep.** —*Aust. J. agric. Res.* **9,** 229-236. **3404**

The effect of falling feed levels on the ratio of mean diameters of primary and secondary fibres is proportionally greater when it is less

than 1·0. This evidence suggests that there is differential response of fibre diameter to changes in nutrition. The ratios of primary to secondary follicle numbers, however, show only negligible variations under considerable nutritional stress.

Distances between primary and secondary follicles are always greater than distances between secondary follicles irrespective of their relative fibre diameters. It is likely therefore that primary follicles have a higher competitive efficiency than secondary follicles, and that the efficiency concept must be reformulated to accommodate differential responses of adjacent follicles to changes in feed level.

—S. S. Y. Young.

Johnson, E. (1958). **Quantitative studies of hair growth in the albino rat. I. Normal males and females. II. The effect of sex hormones. III. The role of the adrenal glands.**—*J. Endocrin.* **16**, 337-350; 351-359 & 360-368. [Author's summaries modified.] **3405**

I. The patterns of the first and second hair growth waves, forming the second and third coats, were followed in albino rats which had been dyed black before the start of hair growth.

The length of hair produced during the growth waves varies from region to region of the body. The duration of the growing and resting periods varies in different areas of the body. As the growth wave spreads over each area every follicle produces a new hair alongside the dead or 'club' hair. Loss of club hairs then begins, and the rate of loss varies from region to region of the body.

In females the growth wave moves more slowly, the definitive length of hair is shorter, and the loss of club hairs is slower than in males.

II. Spaying of female rats aged 7 weeks accelerated the passage of the second wave of hair growth. Longer hairs were produced as a result of faster growth, and the rate of loss of dead or 'club' hairs was increased. Oestradiol implanted into spayed females delayed the initiation and passage of the wave of hair growth. Shorter hairs were produced by a reduced rate of growth, and loss of club hairs was inhibited. Castration of male rats aged 7 weeks accelerated the passage of the second wave of growth, and implantation of testosterone slowed it down. Testosterone had no effect on the definitive length of hair produced or on the rate of loss of club hairs. Oestradiol implanted into castrated males produced the same effects as in spayed females except that it did not affect the time of initiation of the growth wave. Combined implantation of testosterone with oestradiol into castrated males did not offset the inhibitory effects of the oestradiol on hair length or rate of loss of club hairs, but may have slightly speeded the wave of hair growth.

III. Adrenalectomy 2 weeks before the start of the second wave of hair growth advanced the beginning of that wave in female rats, and speeded its passage over the body in both males and females. The rate of loss of club hairs was slightly accelerated, but there was no effect on the definitive length of hair produced. Adrenalectomy after the wave of hair growth had begun was less effective. Corticotrophin (ACTH) did not effect the time at which the wave of hair growth began but delayed its passage. ACTH had no effect on the loss of club hairs in both spayed and spayed adrenalectomized animals. Oestradiol must therefore have some action which is independent of the adrenals. Adrenal hormones delay the passage of the growth wave to a greater extent than ovarian hormones, but they have no effect on the rate of hair growth, and, compared with ovarian hormones, affect the loss of club hairs only slightly. It is therefore suggested that these three main phases of hair growth may be controlled by mechanisms which are at least partially independent.

Hayman, R. H. & Nay, T. (1958). **Sweat glands in Zebu (*Bos indicus* L.) and European (*B. taurus* L.) cattle. 2. Effects of season and exercise on sweat gland volume.** — *Aust. J. agric. Res.* **9**, 385-390. [Authors' summary modified.] **3406**

Seasonal variation in sweat gland volume is reported in two breeds of zebu dairy cattle. Changes which occurred in the volume of sweat glands in Jersey and in zebu × Jersey cattle, as the result of sweating induced by excerise, are described. The crossbred cattle, which had larger sweat glands than the Jerseys, sweated at a greater rate, and had a smaller rise in rectal temperature, which returned more rapidly to normal.

It is suggested that there is a relationship between sweat gland volume and activity, and that the seasonal changes in volume observed in the two zebu breeds are largely due to changes in ambient temperature.

Poole, H. K. & Olsen, M. W. (1958). **Incidence of parthenogenetic development in eggs laid by three strains of Dark Cornish chickens.**—*Proc. Soc. exp. Biol., N.Y.* **97**, 477-478. [Authors' summary modified.] **3407**

Infertile eggs from 3 strains of virgin Dark Cornish pullets were examined either microscopically when laid or macroscopically after

9–10 days' incubation to determine relative incidence of parthenogenetic development. The data indicate that the incidence of parthenogenesis may vary not only in different breeds or strains of birds, but also the observed incidence may vary with different techniques of observation and different times at which these observations are made.

PARIS, R. (1958). **Lactic acid in the urine of thoroughbred racehorses after exercise.** — *Aust. vet. J.* **34**, 111-115. [Author's summary modified.] **3408**

The pH and lactic acid levels were determined in samples of urine obtained from 342 Thoroughbred horses after racing. Exercise was from 1–3 min. over distances of 4–14 furlongs. The mean pH observed was 5·87, and the mean lactic acid 370 mg.%. Maximum concentrations of from 1059–1316 mg.% were found in samples taken at 35–45 min. after exercise started.

The shorter the race, or the more strenuous the effort, the higher the concentration of lactic acid found in the urine.

A significant sex difference was observed between the castrated and the entire animal. Further work is required to determine whether this difference is of real importance from the point of view of racing.

WHITTLESTONE, W. G. (1957). **Some properties of the mammary myoepithelium of the sow.**— *J. Dairy Res.* **24**, 321-327. **3409**

Intramammary pressure was recorded simultaneously from inguinal and pectoral mammary glands by means of a sensitive electro-mechanical recorder of low inertia, which is described in detail. The nature of the pressure changes obtained after unphysiologically high doses of oxytocin (5 to 10 i.u. intravenously) was studied in 8 experiments in 3 sows and special attention given to the latent period before response and to the frequency and amplitude of the periodic contractions recorded after the initial response. These latter characteristics are compared with pressure changes recorded from the amnion in a pregnant woman. —R. J. FITZPATRICK.

BLASCHKO, H. & HAWES, R. (1958). **Observations on spermine oxidase.**—*Biochem. J.* **69**, No. 1. pp. 8P-9P of Proceedings. [Authors' abst. modified.] **3410**

A close relationship seems probable between the rumen and the presence of spermine oxidase in the blood plasma. The sera of a number of mammalian species were examined; none of these had a significant action upon spermine, with the exception of the serum of a ruminant, *Camelus dromedarius*. The camel serum oxidized spermine and spermidine at similar rates; benzylamine was oxidized more slowly. Samples of serum were taken from goat kids at weekly intervals. Spermine oxidase was absent or almost absent from the serum of new-born kids, in which the rumen was not yet functioning, but increased progressively in the first weeks after birth.

STAHL, P. R. & DALE, H. E. (1958). **Blood volumes of dairy calves comparing Cr^{51}-tagged red blood cells and T-1824 plasma dilution methods.** — *Amer. J. Physiol.* **193**, 244-248. **3411**

Repeated measurements of blood volume in 17 calves by the use of Evans blue dye (T-1824) always gave higher results than methods employing radioactive chromium. Causes of the erroneously high results were discussed.—R.M.

KUTAS, F. & STÜTZEL, M. (1958). **Acid-soluble phosphate fractions in the blood at the beginning of postnatal life. II. Changes with advancing age in the organic acid-soluble phosphate content of the red blood cells in the dog and the rabbit.**—*Acta vet. hung.* **8**, 1-10. [In English. Authors' summary modified.] **3412**

The r.b.c. of the new-born dog and rabbit contain less than one third of the diphosphoglycerate in the adult animals. Owing to the low diphosphoglycerate level, the total organic acid-soluble phosphate is also considerably less in neonatal r.b.c. than in those of adults. In the first weeks of postnatal life, a rapid increase occurs in the organic acid-soluble phosphate; this increase is dependent on the changes of the actual diphosphoglycerate concentration. After the third week, there is no longer any appreciable difference in the values for the sucking and the adult animals. A correlation appears to exist between the changes observed and the changes in blood formation.

BRAUNSTEINER, H., PAERTAN, J. & THUMB, N. (1958). **Studies on lymphocytic function.**— *Blood* **13**, 417-426. [Summary in Interlingua. Authors' summary modified.] **3413**

Reactions of cells in inflammed areas were observed on cover-slips. After an initial granulomonocytic phase a massive infiltration by lymphocytes took place. These lymphocytes rapidly hypertrophy and become "mononuclear," "epithelioid" and even giant cells. By injecting 15 to 30 millions of these cells from donors who reacted to tularin or tuberculin, to negative re-

cipients, allergy of the delayed type is specifically transferred as with lymphocytes. The function of the lymphocyte is discussed on the basis of these findings.

BARBORIAK, J. J., DE BELLA, G., SETNIKAR, I. & KREHL, W. A. (1958). **Age related changes in plasma proteins of the fetal goat.**—*Amer. J. Physiol.* **193,** 89-91. **3414**

The percentage of alpha-1, alpha-2 and beta globulins did not change much during foetal development. Gamma globulins were present only in traces. Relative conc. of plasma albumin increased from 6% at 46 days of pregnancy to 45% at 135 days.—R.M.

KOLB, E. (1957). Untersuchungen über das Vorkommen von Glykoproteiden im Serum von Haustieren (Rinder, Schafe, Pferde, Schweine). **[Occurrence of glycoproteins in serum of horse, cattle, sheep and pig.]**—*Arch. exp. VetMed.* **11,** 951-958. **3415**

Normal values for protein-bound hexose and protein-bound glucosamine in serum were given.—R.M.

I. DOYLE, J. T., PATTERSON, J. L., JR., WARREN, J. V., DETWEILER, D. K. & REYNOLDS, M. (1958). **Hemodynamic observations on the cow.**—*Fed. Proc.* **17,** 38. **3416**

II. PATTERSON, J. L., JR., DOYLE, J. T., WARREN, J. V., DETWEILER, D. K. & REYNOLDS, M. (1958). **Respiration in the domestic ox.**—*Ibid.* 122. **3417**

I. In four cows carotid arterial pressure was as high as 275/195 mm. Hg; it tended to fall towards human normotensive level when the animal was left undisturbed. Arterial pressure contours were similar to those observed in the giraffe. Jugular venous, superior vena caval and right atrial pressures were low. Right ventricular and pulmonary arterial systolic pressures ranged from 45 to 112 mm Hg. Cardiac output in 3 animals averaged 44 litres/min. and stroke volume 637 ml. The fourth animal developed a persistent arrhythmia. Cardiac output in this animal was 33 l./min. and stroke volume 330 ml. The general blood volume averaged 63 ml./kg. The data closely resembled those obtained in the giraffe. Bovine placidity appeared to be a literary convention rather than a physiological state.

II. Six non-fasting, moderately lactating cows were studied. Oxygen consumption measured by the open circuit method averaged 2·21 l./min., or 0·35 l./min./m^2, or when calculated by multiplying the cardiac output by the arterial-mixed venous O_2 difference averaged 1·64 l/min. or 0·27 l./min./m.^{2}. Minute ventilation averaged 82 l. and tidal volume 3 l. Dead space (Bohr equation, CO_2) was 1·44 l. The pneumotachogram showed a relatively flat inspiratory plateau with a ratio of inspiration to expiration time of 0·6. Alveolar O_2 pressure measured by direct sampling of end-tidal gas was 119 mm. Hg and CO_2 pressure was 26 mm. Hg. Average O_2 pressure calculated from the alveolar equation was 113 mm. Hg. Mean arterial O_2 pressure measured by direct equilibration technique was 78 mm. Hg and CO_2 pressure 33 mm. Hg. Oxygen consumption of the ox is larger than that of man per unit BSA but similar per (unit body weight) $^{0.734}$. Explanation of the large difference between alveolar and arterial O_2 pressure in the ox awaits further studies.—R.M.

I. REYNOLDS, S. R. M. & PAUL, W. M. (1958). **Relation of bradycardia and blood pressure of the fetal lamb *in utero* to mild and severe hypoxia.** — *Amer. J. Physiol.* **193,** 249-256. **3418**

I. REYNOLDS, S. R. M. & PAUL, W. M. (1958). **Pressures in umbilical arteries and veins of the fetal lamb *in utero*.**—*Ibid.* 257-259. **3419**

I. With mild hypoxia there was normally, but not invariably, an improvement in foetal heart action and this may continue for a short time in spite of a slowing of the heart. With graded degrees of hypoxia heart action may become variable and not just fast or slow. The authors also commented on the extraordinary sensitivity of the cardiovascular system of the foetus to changes in the gas content of the ewe's blood, particularly during periodic breathing of the anaesthetized ewe. [See also *V.B.* **28,** 2611].

II. During the last third of pregnancy normal pressure in the umbilical vein ranged from 20 to 35 mm. Hg and in the artery from 50 to 70 mm. Hg. Hypoxia in the ewe did not often alter pressure in the umbilical vein but that of the artery changed. Increase in intra-uterine pressure increased blood pressure in artery and vein.—R.M.

GÜNTHER, E. (1958). Zur Vascularisation der Uterus-Karunkel des Schafes. **[Vascularization of the uterine caruncles in the ewe.]**—*Zbl. VetMed.* **5,** 171-196. [Summaries in English, French and Spanish. English summary modified.] **3420**

The macroscopic and microscopic features of the cotyledons and their changes in form are described. The arteries and veins of the caruncles show important differences corresponding to their different functional states, and

there is a close relationship between the form of the cotyledons and the behaviour of their blood supply.

In the lamb and yearling sheep the arteries run through the centre of the cotyledon as far as the sub-epithelial layer, where they form a capillary network. During pregnancy this layer changes from cup-shaped to dome-shaped and a spongy tissue develops on the uterine aspect of the cotyledon. This new tissue represents budding of the arterial limbs of the capillaries to form regular radial branches with spindle-shaped enlargements forming a rich capillary network. After parturition these vascular prolongations entirely disappear except for a few fine radial capillaries.

In young sheep the veins develop mainly from the periphery beneath the sub-epithelial layer and unite with its capillaries. During pregnancy they form a rich anastomosis at the exterior of the cotyledon and there are no branches penetrating to its interior. Post-partum involution of the veins brings them back almost to the pre-gravid state. The study of corrosion preparations allows conclusions to be drawn on the form of the crypts. Finally the author discusses relations between maternal and foetal circulation as revealed by a study of the blood vessels of the sheep cotyledon.

DANIEL, P. M. & PRICHARD, M. M. L. (1958). **The effects of pituitary stalk section in the goat.**—*Amer. J. Path.* **34,** 433-469. **3421**

The pituitary stalk was cut in 9 goats, and a wax plate was inserted between the severed ends. This caused a massive infarction of the anterior pituitary lobe though certain areas of this lobe regularly survived. The areas of viable anterior lobe cells were larger in the goats which were allowed to survive for from 1½ to 4 weeks than in those killed in the first 3 days after stalk section. This observation, and the presence of mitotic figures among the surviving cells near the borders of the infarct, suggest that some regeneration of anterior lobe tissue had occurred. The living anterior lobe cells showed a slightly abnormal appearance in both the early and the later stages after stalk section.

The neural portions of the pituitary gland showed evidence of degeneration. The pars intermedia became hypertrophied, and many of its cells were undergoing mitosis.

Marked changes were seen in other tissues of the body, particularly in the other endocrine organs.—R.M.

LARON, Z., MUHLETHALER, J. P. & KLEIN, R. (1958). **The interrelationship between cortisone and parathyroid extract in rats.**—*Arch. Path.* **65,** 125-130. [Authors' summary modified.] **3422**

Normal rats were given injections of parathyroid extract, cortisone, and both hormones together. The action of these hormones was studied by chemical and histological methods. Cortisone antagonized some of the manifestations of parathyroid extract in the blood, teeth, bones, and kidneys. The authors discussed the mode of action of cortisone on calcium metabolism and its interference with the parathyroid action.

HARTMAN, L., SHORLAND, F. B. & CLEVERLEY, B. (1958). **Occurrence of *trans*-unsaturated acids in the faecal lipids of ruminants and non-ruminants.** — *Biochem. J.* **69,** 1-5. [Authors' summary modified.] **3423**

The faecal lipids of several species of ruminants and non-ruminants contained considerable amounts of *trans* acids (9–18% of the fatty acid fraction). The percentage of *trans* acids in bacterial and non-bacterial faecal lipids was similar, the bacteria accounting for approx. 30% of the total amount of these acids. By analogy with the formation of *trans* acids in the rumen, the origin of these acids in the faecal lipids is attributed to the hydrogenating action of intestinal bacteria.

GOLDSWORTHY, P. D. & VOLWILER, W. (1958). **Mechanism of protein turnover studied with cystine-S^{35}, lysine-C^{14} doubly labeled plasma proteins of the dog.**—*J. biol. Chem.* **230,** 817-831. [Authors' summary modified.] **3424**

Doubly labelled plasma from donor dogs given an oral dose of S^{35}-labeled L-cystine and C^{14}-labelled DL-lysine was administered intravenously to recipient dogs. The decrease with time of the concentration of S^{35} and of C^{14} in serial samples of plasma albumin, γ-globulin, fibrinogen, and α-globulin was followed for 60 days in the recipient dogs. The loss of isotope was resolved graphically into several rate processes, the slowest being used to calculate the apparent half life of the isotope in the protein molecule. All corresponding exponential components for both lysine-6-C^{14} and cystine-S^{35} were identical in each protein fraction studied. Average apparent half lives were 16 days for albumin, 19 days for γ-globulin, 20 days for fibrinogen, and 23 days for α-globulin. The significance of these findings is discussed. The data appeared to support the occurrence of complete protein degradation as a mechanism of protein turnover.

SCHMIDT-NIELSEN, B. (1958). **Urea excretion in mammals.** — *Physiol. Rev.* **38,** 139-168. [Author's summary modified.] **3425**

Currently accepted concepts for the renal excretion of urea in mammals are inadequate to explain a number of observations. Of particular importance are: (1) the regulation by the renal tubules of the urea clearance found in rodents, ruminants, dog and man; (2) urea clearances which approach or in certain cases exceed the glomerular filtration rate; (3) the exaltation and abatement of the urea clearance at rising and falling urine flows, respectively; (4) the concentration gradients of urea found in the renal tissue, including the fact that the concentration in the tissue of the renal papilla is identical to the concentration in the urine. A hypothesis for the mechanism of urea excretion is suggested, which is supported by physiological and anatomical findings. It is based on the countercurrent multiplier principle. It is suggested that urea is concentrated in the renal papilla, and consequently in the urine, through an active transport of urea over a relatively low gradient, which is amplified by the multiplier system of Henle's loops and vasa recta.

PENNINGTON, R. J. & APPLETON, J. M. (1958). **Further studies on the inhibition of acetate metabolism by propionate.**—*Biochem. J.* **69,** 119-125. [Authors' summary modified.] **3426**

The production of $^{14}CO_2$ from carboxyl-labelled acetate by homogenates of rat liver was almost completely abolished by propionate in only one-tenth of the concentration of the acetate. Butyrate was a less powerful inhibitor of acetate oxidation. The oxidation of [2-^{14}C] pyruvate was affected to a much smaller extent by propionate, although the incorporation of isotope into acetoacetate was largely suppressed. Oxidation of acetate was strongly inhibited by propionate in homogenates of sheep liver, but less so in homogenates of pigeon liver. Propionate was oxidized by homogenates of rat liver much more slowly than by homogenates of sheep or pigeon liver. The acetylation of sulphanilamide by an extract of rat liver, together with an acetone fraction of pigeon liver containing the amine-acetylating enzyme, was only slightly inhibited by propionate.

The very low rate of oxidation of acetate by homogenates of rat liver in the presence of propionate was increased by the addition of coenzyme A. [See also *V.B.* **27,** 2232.]

See also absts. **3345** (effect of environmental temperature); **3466** (book, reproduction); **3467** (book, Congress Proceedings).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ANON. (1957). **United Nations. Joint FAO/WHO Expert Committee on Milk Hygiene. First report.** — *F.A.O. Agric. Studies* No. 40. pp. 54. [Issued also as *W.H.O. Tech. Rep. Ser.* No. 124.] **3427**

The committee made recommendations as to hygiene on the farm; collection and transport of milk; handling and processing distribution; principles of milk hygiene legislation. It suggested that F.A.O. and W.H.O. should collaborate in the study of buffalo milk; production of sterilized milk in the Tropics; aseptic bottling of sterilized milk; resistance of viruses and rickettsia to heat; detection and inactivation of antibiotics found in milk.—R.M.

ANON. (1957). **Accident at Windscale No. 1 pile on 10th October 1957.** pp. 25. London: *H.M. Stat. Off.* Cmd. 302. 1/3d. **3428**

This report consists of six parts:—(I) the cause of the accident and measures taken to deal with it. (II) the measures taken to deal with the consequences of the accident. (III) report to the Medical Research Council on health and safety aspects. (IV) memorandum by the Chairman of the U.K. Atomic Energy Authority. (V) Note by the U.K. Atomic Energy Authority on the Calder Hall and Civil Power reactors. (VI) Terms of reference and members of the committees referred to in the Prime Minister's memorandum.

I. Details are given of the circumstances in which the accident occurred. The steps taken to deal with the accident were prompt and efficient. These events are described in detail.

II. On the day of the accident a 3-hour sample of air taken outside the Health Physics Administration building between 11.00 and 14.00 yielded a count of 3000 βd.p.m./m^3 compared with a normal level of 200 to 300 βd.p.m./m^3. The appropriate officials were warned and steps taken to make further observations, also further necessary precautions were taken. Rapid monitoring of the personnel concerned was instituted, records being maintained. No worker had to be detained after the accident. Some had hair and hand contamination which was successfully removed by the standard decontamination procedure. A thyroid iodine survey was made among the workers. The I.C.R.P. level for safe continuous and constant iodine activity in the adult gland is 0·1 μc. The highest

iodine thyroid activity measured among the staff was 0·5 μc. Since iodine has a short life some increase over the I.C.R.P. level can properly be made if the dose occurs on a single occasion. A survey was made also for strontium activity, both Sr 89 and Sr 90. The levels found were considered to be at most one-tenth of the maximum permissible body burden. The evidence so far, on radioactive caesium was also considered to be satisfactory.

In the process of examining the limits of the fire some men looked for a few seconds through the plug holes from a distance of a few feet; they were not wearing the appropriate film badges and may have received a dose to their heads additional to that recorded by indicators they were wearing.

Special measures were instituted to protect the public. Wind directions were recorded. There may have been an inversion at a few hundred feet above ground level during part of the period when radioactivity was escaping through the filter. Gamma measurements can be the most quickly made and tests of air in the neighbourhood were made mostly in this way. The highest reading was made on the Calder Farm road, of about ten times greater than the I.C.R.P. level for continuous lifetime breathing. The Health Physics Manager had to think of three types of hazard—gamma radiation to the whole body, inhalation and ingestion. He considered, rightly, that irradiation and inhalation were likely to prove well within acceptable limits for the district and that the main concern should be ingestion. At first it was considered that the activity escaping from the top of the stack was normal fission products and that, therefore, the main risks would come from iodine and strontium. By the morning of the 11th the first analysis of milk samples arrived and the first results of tests of the activity of the air collected in the Windscale Works. There was agreement that there was a far greater proportion of iodine activity than would be in normal fission products. Thus, iodine had come through the filter, but the major part of the particulate material had been caught by the filter. The iodine 131 deposited on the grass is eaten by cattle and quickly carried to their milk, and a major part of the effort of teams assessing the activity in the district was given to milk analysis for iodine. No established tolerance level existed for radioactive iodine in milk, but there was an Agricultural Research Council paper which contained the suggestion that 0·39 μc per litre was the maximum permissible for infants. The first analyses showed a figure of 0·48 μc per litre, but by the second day there was a figure of 0·8 μc per litre and advice was given that milk gathered from the vicinity of the works should not be used. A footnote mentions confusion about times stated in the evidence. There was considerable telephone consultation between public health and other officials as to the action to be taken to safeguard the public with regard to radioiodine in milk. A figure of 0·1 μc per litre was accepted as the probable maximum safe limit in relation to absorption into the thyroid gland in children. Consequently arrangements were made with the police on the evening of the 12th and with the Milk Marketing Board for supplies from 12 milk producers within a two-mile radius of Windscale to be withheld from the market. Checks were all the time extended and it was necessary to restrict distribution in successive stages further afield. By the 14th a coastal strip about 30 miles long and 6-10 broad was under restriction. Samples taken still further afield over a large area showed that there was no further danger. At the time of writing the report, about a month later, the recorded danger levels were decreasing.

Vegetables, eggs, meat and water supplies were found not to be dangerous.

A thyroid iodine survey was made of the inhabitants in the neighbourhood and also on the two strontium isotopes. There was discussion as to the nature of the warning that should have been given to the inhabitants of the surrounding area.

III. On the 15th Oct. the Ministry of Agriculture, Fisheries and Food and the Atomic Energy Authority asked the Medical Research Council for comments on the particular problems arising from the Windscale accident, and that body submitted its report. It found that decontamination measures were adequate. The exposure of the workers to radioactive iodine was not dangerous. Measurements of radiostrontium in the urine of 30 workers considered to be the most exposed were available and the total amount of radiostrontium taken into the body was calculated: it was concluded that, for Sr 89, there cannot be more than one hundredth of that which could be accepted as a sustained level and for Sr 90 even lower. Contamination with radioactive caesium amounted only to a very small fraction of what could be accepted. The workers who looked into the open plug holes were unlikely to have received neutrons known to be especially damaging to the eyes. The measures instituted by the Senior Medical Officer in respect of food served in the Windscale and Calder canteens were adequate and satisfactory.

The measures taken to protect the public

were also examined in detail. Attention was drawn to a delay of 36 hours between receiving dangerous samples and restricting the distribution of milk. When a situation like that in No. 1 Pile developed it would have been wise to have mounted at once an extensive and rapid milk sampling programme throughout the area of possible risk.

The maximum amount of iodine 131 that a child might have received in the longest period that elapsed before uncontaminated milk was brought in from outside was given consideration. It was calculated that the thyroid gland of such a child might have accumulated iodine sufficient to deliver at most a total average dose of 25 rads or up to three times this at any single point within the gland. It happened that among the 28 children in whom the radioiodine content of the thyroid had been determined, there was one believed to receive milk from this district. The amount of radioiodine in the thyroid (and it is the highest recorded anywhere) is calculated to be such as would deliver an average dose of 16 rads. It is believed that these calculations give the measure of the greatest risk that can have been incurred in the whole area throughout which milk distribution was controlled; it was not considered as in any way likely to be serious. It is in the highest degree unlikely that any harm was done to the health of anybody in the course of the incident.

IV. The Chairman of the Atomic Energy Authority submitted a memorandum. Steps had been taken to deal with all matters brought out in the enquiries.

V. The U.K. Atomic Energy Authority commented on certain matters. The accident which occurred at Windscale could not happen with the Calder Hall reactors, or with the reactors being built for the Electricity Authorities. The later reactors incorporated improvements based on earlier experience. These matters were discussed in detail.—W.A.P.

SAVI, P. (1958). Indagini sui rapporti tra l'uso degli antibiotici a scopo conservativo e l'esame batteriologico delle carni. **[Effect of antibiotics (as meat preservatives) on the bacteriological examination of meat.]**—*Vet. ital.* **9,** 91-102. [Summaries in English, French and German.] **3429**

Rabbits in various stages of experimental infection with *S. typhi-murium* were given an i/v injection of oxytetracycline and killed 30 min. later. The organism was demonstrated culturally in the organs and muscles (in some cases) immediately after slaughter and 24 hours later. Guinea-pigs, experimentally infected with *B. anthracis,* were killed 1 hour after i/p injection of oxytetracycline, the organism was demonstrated in organs and muscles by cultural and biological methods.—T.E.G.R.

SHENSTONE, F. S. & VICKERY, J. R. (1958). **Studies in the preservation of shell eggs. 8. The effects of the treatment of shell eggs with oil.**—*Tech. Pap. Div. Fd Pres. C.S.I.R.O., Aust., No.* 7. [Abst. from authors' summary.] **3430**

The effects of oil coating (with and without addition of aluminium or magnesium stearate (or both)) on the rate of loss of "quality" during the storage of eggs at atmospheric and cold storage temperatures were investigated. Appreciable benefits were obtained by coating only when they were applied within 24 hours of laying. It was concluded that, under the conditions existing in the Australian egg industry, the only benefit to be derived from the application of oil is in the reduction of the rate of weight loss.

See also absts. **3089** (TB. in pasteurized milk); **3119-3121** (salmonella in food); **3130** (brucellosis); **3141** (persistence of brucella in cream).

REPRODUCTION AND REPRODUCTIVE DISORDERS

SØGNEN, E. & FILSETH, O. (1958). Det optimale tidspunkt for insemination etter kalving. **[The optimal time for insemination after calving.]**—*Nord. VetMed.* **10,** 331-339. [In Norwegian. Summaries in English and German. English summary modified.] **3431**

Studies on 3,091 cows showed that insemination within the interval 60–130 days post-partum on average yields the highest percentage of pregnancy compared with intervals before 60 and later than 130 days. Pregnancy initiated within this interval also is most favourable economically, as it means the highest yield of milk over a longer period of time.

Insemination frequency reached maximum within the interval 45–55 days; only 56% of the inseminations take place in the 60–130 days interval whereas 37% are inseminated before 60 days. The reasons behind this are mentioned.

WILLETT, E. L. & OHMS, J. I. (1958). **Influence of seminal plasma and maturity of bovine spermatozoa upon their freezability.**—*J. Dairy Sci.* **41,** 90-95. [Authors' summary modified.] **3432**

In two experiments spermatozoa were frozen in yolk–citrate diluent. In the first seminal plasma was interchanged between first and

second ejaculates. The superiority of spermatozoa from the second over the first ejaculates remained, whether plasma from the same or the other ejaculate was in the medium or whether the plasma was removed. In the second experiment, the resistance to freezing of spermatozoa in the cauda epididymis was superior to that in the ampulla, although not significantly so. The evidence from these two experiments indicates that the greater resistance to freezing of spermatozoa from the second over the first ejaculate can be attributed to characteristics of the cells and not to differences in seminal plasma.

MAUPOUMÉ, R. & VERAIN, A. (1958). Comportement des spermatozoïdes de taureau vis-à-vis des ultrasons. [**Action of ultrasonic waves on bull spermatozoa.**]—*C. R. Acad. Sci., Paris* **246**, 2407-2409. **3433**

Bull semen diluted with egg-yolk and citrate was exposed to ultrasonic waves at an intensity of 10 W/cm.^{2} for $\frac{1}{2}$ or 1 min. It was claimed that treatment increased fertility and prolonged the life of spermatozoa in diluted semen [details of results not given.]—R.M.

WALES, R. G. & WHITE, I. G. (1958). **The interaction of pH, tonicity and electrolyte concentration on the motility of dog spermatozoa.**—*J. Physiol.* **141**, 273-280. [Authors' summary modified.] **3434**

The motility of dog spermatozoa was studied *in vitro*, under various modifications of pH, osmotic pressure and chemical composition of diluents. The glucose and sodium chloride content of the diluents was varied to give tonicity ranging from 0·45 to 1·8% sodium chloride. These diluents were buffered with citric acid-phosphate, sodium phosphates, sodium carbonate–bicarbonate or veronal–hydrochloric acid mixtures. The sodium carbonate–bicarbonate buffer mixture depressed motility of dog spermatozoa, but all the other buffers were innocuous. Maximum motility was attained in the 7·0–8·5 pH range. The pH of the spermatozoa-bearing fraction was $6{\cdot}3 \pm 0{\cdot}23$ and that of the prostatic fluid $6{\cdot}8 \pm 0{\cdot}33$. At a pH of 8·7–8·9 partial replacement of sodium chloride by glucose was favourable in isotonic and hypertonic diluents. Under all conditions hypotonic diluents were more deleterious than hypertonic ones of similar composition.

WALES, R. G. & WHITE, I. G. (1958). **The interaction of pH, tonicity, and electrolyte concentration on the motility of fowl spermatozoa.** — *Aust. J. biol. Sci.* **11**, 177-186. [Authors' summary modified.] **3435**

The motility of fowl spermatozoa was studied *in vitro* under various modifications of pH, osmotic pressure, and chemical composition of diluents. The glucose and sodium chloride content of the diluents was varied to give tonicities ranging between that of 0·45 and 1·8% sodium chloride. These diluents were buffered with citric acid–disodium phosphate, sodium phosphates, or sodium carbonate–bicarbonate mixtures which were equally innocuous.

Fowl spermatozoa showed maximum motility at pH 7 and the pH of fowl semen was $7{\cdot}6 \pm 0{\cdot}42$. At a pH of 8·7–8·9 partial replacement of sodium chloride by glucose was favourable in hypotonic, isotonic, and hypertonic diluents.

Under all conditions hypotonic diluents were more deleterious than hypertonic ones of similar composition and the spermatozoa were able to adapt themselves partially to extreme osmotic pressures.

MEGALE, F. (1957). Peritonioscopia aplicada ao exame clínico dos órgãos genitais internos da ovelha e da cabra. [**Peritoneoscopy for examination of the female genital organs in sheep and goats.**] — *Arch. Esc. Vet. Minas Gerais* **5**, 251-278. [In Portuguese. Summary in English.] **3436**

M. examined by peritoneoscopy the genital organs of 15 goats and 10 ewes, the majority of which were normal.—R.M.

ALLISTON, C. W., PATTERSON, T. B. & ULBERG, L. C. (1958). **Crystallization patterns of cervical mucus as related to estrus in beef cattle.**—*J. Anim. Sci.* **17**, 322-325. [Authors' summary modified.] **3437**

Crystallization patterns of cervical mucus appeared to be related to ovarian activity of the female. The patterns formed immediately before during and after oestrus were fern-like and more extensive than during the luteal phase.

The first indications of the fern-like patterns of crystallization of cervical mucus appeared about 3·5 days before oestrus. These patterns reached a maximum at oestrus and began to decline before ovulation occurred. Vaginal mucus was less reliable than cercival mucus as an indicator of approaching oestrus.

Although reasonable care must be exercised, extensive equipment and aseptic conditions are not essential for obtaining results that on the average appear to be satisfactory for predicting time of oestrus within relatively narrow time limits.

SANGER, V. L., ENGLE, P. H. & BELL, D. S. (1958). **The vaginal cytology of the ewe**

during the estrous cycle.—*Amer. J. vet. Res.* **19,** 283-287. [Authors' summary modified.] **3438**

Vaginal smears from 2 ewes during normal oestrous cycles were studied, using the Papanicolaou staining technique. A teaser ram was used to detect oestrus. In pro-oestrus, only small groups of large, flat, squamous basophilic cells were present. Some showed early cornification. Cells were distinct and well separated. In oestrus, only a few cells were found on the slide. These were squamous; about two-thirds were basophilic and one-third acidophilic (cornified). A few had folds, wrinkles, and curled edges. All cells were separate and distinct. In metoestrus and dioestrus, smears were thick and sticky; cells were clumped or piled up, and nearly all were cornified. Neutrophiles and bacteria were abundant. There was a marked difference between the dioestrous and pro-oestrous phases, between the pro-oestrous and oestrous phases, and between the oestrous and metoestrous phases of the cycle in the ewe. Much less difference was apparent between the metoestrous and dioestrous phases.

AJELLO, P. (1958). Alcune ricerche sulla migrazione dei nemaspermi nelle vie genitali della capra. **[Migration of spermatozoa in the genital tract of the goat.]**—*Zootec. e Vet.* **13,** 50-53. [Summaries in English and French.] **3439**

In studies on 32 goats it was observed that spermatozoa reached the upper part of the oviduct between 5 and 25 hours after mating; their number in the oviduct was very small; and migration appeared to be subject to changes occurring at oestrus, irrespective of ovulation. —T.E.G.R.

VENABLE, J. H. & MCDONALD, L. E. (1958). **Postparturient bovine uterine motility—normal and after experimentally produced retention of the fetal membranes.**—*Amer. J. vet. Res.* **19,** 308-313. [Authors' summary modified.] **3440**

An intra-uterine balloon was used to study uterine motility during the puerperal period in 19 cows and in 6 experimental cows with the corpora lutea removed, 5 of which retained the foetal membranes.

Normal puerperal uterine motility in the cow was found to consist initially of strong rhythmic contractions occurring at the rate of 14 an hour. These contractions diminished both in rate and in amplitude and they were not recorded beyond 48 hours after parturition. Increased uterine motility was recorded during suckling in 2 of 6 normal cows.

Cows with experimentally produced retention of the foetal membranes had increased motility averaging 19 contractions an hour, which persisted for at least 3 days. Abnormalities in the contraction pattern of the experimental group consisted of tetanic contractions and the appearance of secondary superimposed undulations.

EL-ATTAR, T. & TURNER, C. W. (1957). **Spectrophotofluorometric determination of estrogens in the urine and feces of cows during different stages of pregnancy.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 641. pp. 48. **3441**

Urine and faeces samples were collected simultaneously from 20 cows of different breed, age, body weight and stage of pregnancy. The amount of faecal and urinary oestrogen was low until about 170 days of pregnancy, then it increased. Total oestrogen excretion varied greatly among individual cows at almost identical stages of pregnancy. This individual variation increased wih advanced stages of pregnancy.

The average total daily (urine and faeces) oestrogen excretion was 4·49 mg. (calculated as oestradiol) in four cows pregnant 91 to 109 days, 5·56 mg. in five cows pregnant 120 to 170 days, 19·11 mg. in six cows pregnant 185 to 234 days, and 20·13 mg. in five cows pregnant 248 to 273 days. In 14 cows the faecal oestrogen excretion was higher than urinary oestrogen, while in 6 cows, pregnant more than six months the urinary exceeded the faecal oestrogen.

The major oestrogen in urine and faeces was non-ketonic phenolic steroid (calculated as oestradiol).—R.M.

I. VELLE, W. (1958). **Studies on oestrogens in cattle. The metabolic transformation of oestradiol-17β to oestrone and oestradiol-17α in the young calf.**—*Acta endocr., Copenhagen* **28,** 186-191. [In English.] **3442**

II. VELLE, W. (1958). **Studies on oestrogens in cattle. The metabolic transformation of oestrone to oestradiol-17α in the young calf.**—*Ibid.* 192-196. [In English.] **3443**

I & II. Metabolites of oestrone and oestradiol-17 β present in the urine of calves were analysed. Results confirmed those obtained in other animals.—R.M.

HART, P. C., V.D.VEEN, H. E., FRENS, A. M., DAMMERS, J. & GEESSINK, E. F. (1958). Proefnemingen over hormonale castratie met behulp van "Lynoral". **[Trials of hormonal castration of gilts with ethinyloestradiol.]**—

Tijdschr. Diergeneesk. **83,** 363-379. [In Dutch. Summaries in English, French and German.] **3444**

Administration of ethinyloestradiol commenced 2 months before the estimated date of the first oestrus: 0·05 mg. was added to the food daily for 11 weeks. In a second experiment two rates of dosage were employed over a period of 2–3 months, commencing when the gilts reached 70 kg. body wt.: either 0·2 or 0·5 mg. was given daily or 6 mg. was given once a fortnight. In neither experiment was any inhibition of oestrus observed, and the drug had no apparent influence on growth, food utilization, dead weight, carcass quality, or composition of the meat. Neither did it influence the chemical composition of the blood or the structure of the ovary, oviduct, thyroid gland or pituitary gland. The trial included comparisons with surgically castrated and normal untreated gilts.—R.M.

SIRAGUSA, F. (1958). Ricerche sulle variazioni del tasso lipemico in caprini sottoposti alla cosidetta castrazione ormonale. **[Effect of hormonal castration on blood lipids in goats.]** — *Zootec. e. Vet.* **13,** 41-46. [Summary in English.] **3445**

There was an increase in the blood lipids of 4 of 6 goats subjected to hormonal castration. —T.E.G.R.

HANKA, L. J. & LOCKHART, W. R. (1958). **Antimicrobial action as a basis for measurement of diethylstilbestrol.** — *J. Bact.* **75,** 471-473. [Authors' summary modified.] **3446**

The inhibitory effect of diethylstilboestrol on a strain of *Staphylococcus aureus* was used for measurement of this hormone. Two techniques are described: a disk-plate assay measuring concentrations of stilboestrol from 200–10,000 μg./ml., and 2 possible broth-tube assays measuring concentrations between 2 and 7 μg./ml., or concentration differences of 0·25 μg./ml.

DAWSON, F. L. M. (1958). **Bovine cystic ovarian disease: an analysis of 48 cases.**—*Brit. vet. J.* **114,** 96-105 & 134-142. **3447**

Analyses of the bacteriological and pathological findings in 48 barren dairy cows with cystic ovarian disease, observed for at least 4 weeks before slaughter, revealed that there were 7 cases with cysts of definite luteal type. Two of these appeared typical virilism cases exhibiting masculine voice and behaviour changes. In the uteri of 4, cystic glandular dilatation was plainly evident despite severe endometritis. The main group of 39 animals could be divided into two subgroups, those exhibiting nymphomania with some form of regular ovarian cycle with corpus luteum formation, and those with simple nymphomania. The former numbered 15, of which 6 showed some masculinization and 6 relaxed pelvic ligaments. Only 20% showed severe endometritis whilst oestral mucus was found to be present at only 48·5% of clinical examinations. The simple nymphomania cases numbered 26, of which 5 were considered low oestrogen producers, 10 moderate, and 8 high. Two showed some masculinization. Oestral mucus was found at 81·5% of examinations, the pelvic ligaments were relaxed in 13 of the cases and severe endometritis was present in 45%. 18 of the 34 uteri examined yielded organisms, 6 of which were possible pathogens. Heat-like signs occurred in half the cases whose behaviour was rated "anoestrous."—A. ACKROYD.

BRADEN, A. W. H. (1957). **Variation between strains in the incidence of various abnormalities of egg maturation and fertilization in the mouse.** — *J. Genet.* **55,** 476-486. [Author's summary.] **3448**

The incidence of the following types of abnormalities of egg maturation and fertilization was studied in 6004 fertilized eggs from the inbred mouse strains, CBA, C57BL, A and RIII and the outbred stocks, J and V: polyspermy, suppression of second polar body formation, suppression of first polar body formation, cleavage of the egg at meiosis ('immediate cleavage'), uninucleate eggs, and eggs with subnuclei in addition to, or in place of, the normal female pronucleus. The mean incidence over all strains of these six types of abnormality was 0·8, 0·9, 0·3, 0·3, 1·6 and 0·8%, respectively. A significant variation between strains or stocks in the incidence of an abnormality was found in each instance, with the exception of polyspermy. This is taken as evidence that the susceptibility of eggs to the various types of abnormal development is controlled by the genotype of the female. With two types of abnormality, 'immediate cleavage' and uninucleate eggs, the evidence also suggested an interaction between the male and female genotypes. The possibility that adult gynandromorph mice arise through cleavage of eggs at meiosis is discussed. The findings are also discussed in relation to the results of other workers on the incidence of heteroploidy in 3½-day mouse embryos.

HANSEN, L. H. & JAKOBSEN, K. F. (1958). Kejsersnit hos soen. **[Caesarian section in sows.]**—*Nord. VetMed.* **10,** 217-233. [In Danish. Summaries in English and German. English summary modified.] **3449**

A report is given of the post-operative course of 27 caesarian sections performed on sows and gilts. Indications were: narrow pelvis; large foetus; swelling of the birth canal; insufficient dilatation; retarded parturition; insufficient uterus contraction plus abortion; uterine torsion. Operation was under general anaesthesia plus local anaesthesia or local anaesthesia alone. The technique is described in detail. 19 recovered.

JAAP, R. G. (1958). **Black abdomen—a pleiotropic effect of plumage color genes in broiler chickens.**—*Poult. Sci.* **37,** 112-116. [Author's summary modified.] **3450**

Black pigment on the external abdominal muscles of broiler chickens is deposited after hatching and before ten days of age. The highest percentage of chicks with visible melanin in the abdomen was 86% of males and 96% of females in a strain of White Plymouth Rocks, and 83% of males and 98% of females in a columbian coloured crossbred. Within each strain or cross more females than males have black in the abdomen. Testosterone propionate does not decrease, nor does dienoestrol diacetate increase the incidence. Least melanin deposition in the abdomen was observed in White Leghorns which were homozygous dominant white (*II*). When *I* was heterozyous, the lowest incidence of black (no males and 6% of females) was observed when genes *E, B* and *S* were in the genotype. Recessive white (*c c*), which inhibits melanin production in the feathers, appears to favour its deposition on the external abdominal muscles.

SCHLUMBERGER, H. G. (1958). **Sex-linked hyperostosis in the parakeet.**—*Amer. J. Path.* **34,** 562. [Author's abst. modified.] **3451**

Among approx. 1,000 parakeets *Melopsittacus undulatus,* examined P.M. during the past 3 years, 20 females aged 2 to 4 years had multiple hyperostoses; no male bore similar lesions. The skull, sternum, vertebrae, and sacrum were most often affected. The overgrowths ranged from 2 or 3 mm. to 3 cm. in diameter; some that arose from the retro-orbital bone led to exophthalmos. Nerve pressure from sacral exostosis produced leg paralysis. Histologically, some lesions consisted of dense bone; elsewhere they were composed of long osseous trabeculae, separated by connective tissue and bordered by solid rows of osteoblasts. Haversian canals were absent; cement lines were prominent.

Laying hens normally produce large amounts of endosteal bone in the humerus and femur; similar changes were found in some of the birds with hyperostoses. This and the sex-linkage of the lesions suggest that an excess of oestrogen may be a causative factor, but no consistent ovarian abnormalities were observed. Stilboestrol (4·5 to 7 mg.) induced endosteal bone formation. This was also accompanied by lipaemia and hypercalcaemia ranging to 75·5 per 100 ml. of blood. In 16 birds, 4·5 mg. pellets of stilboestrol were introduced subcutaneously. Four of the 10 parakeets that survived over 100 days developed hyperostoses. Among 11 birds receiving 7 mg. of stilboestrol monthly and surviving over 100 days, 5 had hyperostoses; of 6 that received 3 mg. monthly and survived over 100 days, 3 developed hyperostoses. The lesions were usually limited to the sacrum, but in 2 cases nodules were present on each of 2 ribs. Though only 2 to 5 mm. in diam., these hyperostoses resembled the spontaneous variety grossly and histologically.

I. STROMBERG, M. W. & KITCHELL, R. L. (1958). **Studies on myoclonia congenita. I. Review of literature and field investigations.**—*Amer. J. vet. Res.* **19,** 377-382. **3452**

II. HANSON, L. J., STROMBERG, M. W., KITCHELL, R. L. & KERNKAMP, H. C. H. (1958). **Studies on myoclonia congenita. II. Gross and microscopic pathology.**—*Ibid.* 383-387. [Authors' summaries modified.] **3453**

I. A field investigation of congenital tremor of baby pigs was conducted in 42 affected herds for 2 years. The disease appeared to be fairly common and the 42 cases investigated probably represented 10 to 15% of all births. The incidence was considerably greater among the offspring of gilts than of sows. The authors refuted theories that this disease was associated with inadequate nutrition or with swine fever. Breed and sex of the pigs did not seem to be factors. It was suggested that the sire plays a significant role in the transmission of this disease and that it is not genetically transmitted but is infectious.

II. The gross pathological changes indicated that vascular damage was probably the primary lesion, with the nervous system involved secondarily. The vascular lesions of congenital tremor were similar to those of equine arteritis. Work is now in progress on attempts to isolate an infectious agent from pigs with tremor. The most consistent microscopic change was a widespread vasculitis involving the smaller arteries and, occasionally, some of the smaller veins. The lesion was inflammatory, degenerative or, occasionally, proliferative, with partial or complete

obliteration of the lumen. The process involved either part or all of the vessel wall and appeared to be segmental. Ruptured vessels were observed at numerous sites throughout the body, and haemorrhage, oedema, and congestion of the tissues involved were noticed frequently.

See also absts. **3466** (book, physiology and A.I.); **3467** (book, Congress Proceedings).

ZOOTECHNY

SULLIVAN, J. J. & WILLIS, L. A. (1958). **Santa Gertrudis-Hereford cross gave more weight.**—*Qd agric. J.* **84,** 167-174. [Authors' summary modified.] **3454**

Santa Gertrudis–Hereford cross steers on native pastures in Queensland gained an average of 879·4 lb. a head in 774 days compared with 708·7 lb. by Hereford steers under identical conditions.

Regular weighings of 34 steers were made from March 1955, till they were slaughtered in May 1957.

Carcass appraisal results were slightly in favour of the crossbreds, and at ruling market prices the crossbreds returned about 25% (£6/2/6) more than the Herefords.

DONEY, J. M. (1958). **Effects of inbreeding on four families of Peppin Merinos. 2. The influence of inbreeding on age trends.** — *Aust. J. agric. Res.* **9,** 252-259. **3455**

The effect of inbreeding on lambing performance and fleece characters was investigated. Comparisons between non-inbred and inbred ewes with a coefficient of inbreeding of 20% or over were made.

Inbred ewes require about 5 years to reach their peak lambing performance and 4 years to reach their maximum fleece weight, about one year slower than the non-inbred ewes.

For fleece components age trends and differences between inbred and non-inbred sheep do not appear to be large: small differences in mean staple length and fibre diameter are found. Differences in mean fleece weight between the two groups of ewes therefore may be due to a greater total number of fibres per sheep.

Dry ewes, in both groups, grow more wool than those rearing a lamb. This appears to be mainly due to the greater staple length in dry ewes.—S. S. Y. YOUNG.

TECHNIQUE AND APPARATUS

SCHIEMANN, E. (1958). Die Verwendung von radioaktivem Phosphor (^{32}P) and Schwefel (^{35}S) in der Mikrobiologie. Übersichtsreferat. **[Use of radioactive phosphorus and radioactive sulphur in microbiology.]**—*Zbl. Bakt. I. (Ref.)* **167,** 153-190. **3456**

A review of over 200 publications relating to the practical application of these isotopes in bacteriology and virology.—R.M.

NEWMAN, H. J. & TAYLOR, M. W. (1958). **A cannulated Thiry-Vella fistula in the chicken.**—*Amer. J. vet. Res.* **19,** 473-477. [Authors' summary modified.] **3457**

A modification of the Thiry-Vella fistula for study of absorption from the small intestine of the chicken is described. The ends of the isolated loop of intestine are exteriorized by means of nylon cannulas. The interrupted intestine is anastomosed. In the majority of 110 fowls operated upon, the fistula functioned satisfactorily. Some birds survived for six months with no apparent ill-effects.

See also abst. **3123** (flocculation test for pullorum disease).

REPORTS

GREAT BRITAIN (1958). **Report on the Animal Health Services in Great Britain, 1956, including report of proceedings under the Diseases of Animals Act, 1950.** pp. 112. London: H.M. Stat. Off. 6s. **3458**

There were 32 primary outbreaks of FOOT AND MOUTH DISEASE. Of these imported meat or bones caused 13 outbreaks, swill 2, imported meat wrappers 2, disease introduced from the Continent 11, and 4 unclassified. Most of the outbreaks occurred in the period August to December; only 13 outbreaks were in the first seven months of the year. 19 outbreaks were attributed to bird migration: they occurred among grazing cattle and in a number of cases the type of virus found was one prevalent on the Continent. Of the 32 primary outbreaks the type of virus was type "O" in 10, type "C" in 14 and type "A" in 7; in one case the virus was not typed. The total number of outbreaks was 162.

741 outbreaks of SWINE FEVER were confirmed (about half of the total in 1955). Crystal Violet Vaccine issues were 1,112,000 doses—over the million figure for the third successive year.

Eleven outbreaks of ATROPHIC RHINITIS were confirmed; seven outbreaks among progeny of Landrace pigs imported from Sweden in 1953 and the other four from the Isle of Man. All the 2,582 pigs were slaughtered and 20% were found to have lesions.

ANTHRAX occurred in each month of the year and totalled 1,245 outbreaks. During the first four months of the year there were 934 outbreaks. The total number of outbreaks was the highest since 1910. The deaths were 968 cattle, 352 pigs, 4 sheep, 2 horses, 3 mink and 1 goat. The sources of infection were mainly imported feeding stuffs and fertilizers and previous outbreaks on premises.

The fine summer of 1955 favoured development of *Hypoderma* larvae and WARBLE INFESTATION increased in 1956 as expected. The Isle of Wight experiment of 1953–55 to suppress warble fly is mentioned. In 1954 there were 52 herds infected and the percentage of cattle infected was 7·4 whereas in 1955 and 1956 there were 9 and 7 herds infected and in each of these years only 0·7% of the cattle showed infection after three and four annual dressings respectively.

There were 956 outbreaks of NEWCASTLE DISEASE and 1,205,181 birds were slaughtered and 1,005,023 hatching eggs destroyed at a cost of £1,371,710 in compensation. Outbreaks occurred in each month of the year. The outbreaks were in Lancashire 550; Lincolnshire 121; and Essex 84. The whole of Scotland and 21 counties of England and Wales were free from the disease in 1956.

The progress of the Bovine TUBERCULOSIS Eradication Plan is reviewed. At the end of 1956 there were nearly seven million attested cattle in Great Britain. Early in 1956 four more areas containing one and a half million cattle were selected for immediate development as Eradicaion Areas in March 1958. By the end of 1956 tests had been made of more than 5,000 herds in these areas under the plan.

TUBERCULOSIS (ATTESTED HERDS) SCHEME 1950. New admissions to the voluntary scheme are only permitted outside the attested areas. Progress continued at a good rate giving a net addition of 15,600 herds to the Register. All reactors to tests carried out voluntarily in the above scheme are slaughtered and compensation paid. In 1956 this was £487,867.

23 cattle were slaughtered on four farms on account of *Brucella melitensis* infection. The compensation paid was £1,805. It has been decided not to slaughter cattle infected with *Br. melitensis* as the organism from cattle does not appear to be any more pathogenic for man than is *Br. abortus*.

There was a fall in vaccinations under the BOVINE CONTAGIOUS ABORTION calf vaccination scheme but an increase in vaccinations by practitioners outside the official scheme. 663,000 doses were issued by the Laboratory.

VETERINARY LABORATORY, WEYBRIDGE. The demand for *Brucella abortus* (Strain 19) vaccine continues at a high level. Over half of the issues were for the calf vaccination scheme.

VIBRIOSIS—Treatment experiments in the male show that local application of streptomycin 2 g. and 1 megaunit of penicillin in oil into the prepuce once a day on four successive days cured 13 of 14 infected bulls. The one failure was cured by a repetition of the treatment. Two bulls treated as above with 1 g. of aureomycin in oil and two others by 1 g. of terramycin in oil were also cured. Aureomycin used at 48-hour intervals failed to cure when used on one infected bull. Two bulls were cured by i/m injections of 6 g. of streptomycin on each of five successive days.

The complement-fixation test for JOHNE'S DISEASE is of value in confirming suspected cases and in reducing the risk of introducing the disease into a clean herd by purchased animals. Ileo-caecal lymph nodes of 242 cattle examined for *M. johnei* from a knackery showed 34% infected. Foetal infection is proved conclusively in that two strains of acid-fact bacilli, isolated from foetal spleen and maternal cotyledons respectively, set up Johne's infection in calves.

TUBERCULOSIS. Of approximately 850 samples examined for TB. under the Attested Herds Scheme and the Tuberculosis Order, about 23% were positive. 243 "no-visible-lesions" specimens from reactors on detailed laboratory examination showed 14% infected with tubercle bacilli, including 5% avian type; of the 209 negative specimens, 80 had parasitic lesions, one actinobacillosis and one *Corynebacterium pyogenes*. One reactor had human type bacillus in lymph nodes without visible lesions. Thirteen avian type infections in cattle were diagnosed. Two showed progressive disease, one in the thoracic cavity and the other in the mesenteric lymph nodes and udder with excretion of avian type organisms in the milk. TB. was confirmed in only four udders and three other milk samples and also in three cases of

TUBERCULOUS MASTITIS and two positive samples of vaginal discharge from attested herds.

TUBERCULOID MASTITIS. 23 new cases of mastitis caused by acid-fast bacilli which grow more rapidly than tubercle bacilli on culture media were diagnosed. These cases appear to develop in the dry period of the cow and it is probable that therapeutic agents in oil suspension predispose to this type of mastitis. *Mycobacterium smegmatis* occurred in most cases, but *M. fortuitum* was also found, as well as others being studied.

BOVINE MASTITIS. A type of mastitis without any demonstrable pathogenic bacteria has been investigated. The results of examination of 3,811 mastitis samples from clinical cases show: sterile 26·66%; *Staph. pyogenes* 24·12%; *Str. dysgalactiae* 12·83%; *Str. uberis* 9·05%; *Str. agalactiae* 3·89%; mixed streptococcal and staphylococcal infections 7·11%; *C. pyogenes* 2·68%; mixed infections with *C. pyogenes* and other organisms 0·89%; *Pseudomonas pyocyanea* 0·71%; other infections (yeasts, Group C streptococci, coagulase-negative staphylococci, *Actinomyces*, etc.) 4·54%. Vaccination has no effect on old *Str. agalactiae* infection nor has it prevented new infections. The use of chlorophenyl-diguanido-hexane as a disinfectant at 1/5,000 and 1/10,000 had no beneficial effect.

Other conditions being investigated are:—

INFERTILITY due to a virus in cattle. The development of a diagnostic Laboratory test is progressing.

A virus isolated from calves with "MUCOSAL DISEASE" COMPLEX has been reported.

Experiments show that cattle may recover completely from LUNGWORM DISEASE (HUSK or HOOSE) without treatment. An attempt is being made to use the complement-fixation test to follow the antigenic response to infection with *Dictyocaulus*.

Other Conditions mentioned briefly:—

TRICHOMONIASIS. Only 2 cases positive reported by V.I.O's. 230 samples of vaginal mucus examined at the Laboratory were negative.

MYCOLOGY. Cases were RINGWORM, MYCOTIC ABORTION and MYCOTIC DERMATITIS. *Aspergillus fumigatus* was the predominant fungus found in MYCOTIC ABORTION.

Metabolic Disorders, HYPOMAGNESAEMIA, ACETONAEMIA, copper metabolism in cattle and FLUOROSIS are reviewed.

THE VETERINARY INVESTIGATION SERVICE. A noteworthy feature is the high incidence of PARASITIC GASTRO-ENTERITIS in young cattle.

Various forms of abortion in cattle were investigated. Only 26% of abortions were due to brucella or other pathogens, including fungi. COPPER POISONING occurred from an excess of Cu in a milk substitute. RAGWORT POISONING was due to the presence of this poisonous weed in silage or hay.

HYPOMAGNESAEMIA in sheep frequently occurred.

ABORTION due to *Salmonella abortus-ovis* was confined to the far western counties of England; only a few abortions were due to *Vibrio fetus*.

Nematodirus infection was less prevalent. Piperazine citrate dosing had little effect on these worms.

FOOT ROT. 10% formalin soln. for 1 min. after careful paring cured all after three treatments.

As a blowfly repellent dieldrin gave 20 weeks' proection. For SHEEP SCAB (*Psoroptes ovis*) BHC gave better protection.

MYCOTIC DERMATITIS in some sheep flocks was less prevalent but some flocks remain infected.

A survey into causes of losses in pigs is in progress. Field trials with rabbit-adapted SWINE FEVER virus have been successful.

There were 563 outbreaks of FOWL TYPHOID (*Salmonella gallinarum* infection). Two vaccines which may be useful have been tested and gave fairly good results.—J. A. GRIFFITHS.

NEW ZEALAND. (1957). **Annual report of the Animal Research Division of the New Zealand Department of Agriculture 1956-57.** —[FILMER, J. F.] pp. 50. Wellington: R. E. Owen, Govt. Printer. **3459**

The Diagnostic Services at Wallaceville and Ruakura examined 45,463 specimens.

The cause of FACIAL ECZEMA, "toxic herbage," is being collected and dried for chemical investigation. Further progress has been made in the fractionation of extracts of toxic herbage. A fraction has been prepared which contained only 1/25,000 of the original dry matter with little loss of toxicity. A reliable quantitative chemical test for the liver damage factor would be of value for identifying the plant species.

Control of BRUCELLOSIS in sheep by the use of Strain 19 *Br. abortus* vaccine is being studied. In 139 lambs born dead, *Br. ovis*, the only pathogen identified, was recovered from 25.

Toxoplasma-like organisms were found in two sets of foetal membranes showing lesions of TYPE II ABORTION. In a test inoculation the organisms caused abortion in two ewes. Toxoplasma was cultured from these membranes.

Heavy lamb losses occurred in the northern part of North Island and *Vibrio fetus* was found to be the cause.

PNEUMONIA in sheep occurs after dipping and in other cases *Pasteurella haemolytica* was found to be the cause. In 4 cases a virus was found but it was not possible to reproduce the disease with the *Past. haemolytica* recovered or the virus or a combination of both. A chronic type of pneumonia similar to JAAGSIEKTE was diagnosed in the Taumarunui area.

CONGENITAL MUSCULAR DYSTROPHY. Those lambs which were bottle-fed recovered.

Dihydrotachysterol (A.T.10) given to cows as a prophylactic against MILK FEVER failed to prevent the condition.

In a small experiment 8 cows inseminated with semen artificially infected with *Vibrio fetus* were inoculated directly into the uterus two days later with 1 g. of streptomycin in 30 ml. of isotonic saline injected through a catheter. All became pregnant. Of the untreated controls only half became pregnant.

CONTAGIOUS ABORTION OF CATTLE. In a survey of herds where calfhood vaccination had been practised continuously for years 35·8% of the first 53 herds tested were entirely free from *Brucella abortus* infection. In others the infection rate was not high—3·3% in 3,151 tested. 66% of the herds had less than 2·5% infected cows. The highest was 16·4% infected.

The incidence of JOHNE'S DISEASE has increased in the past ten years.

A clinical syndrome in month-old calves, which failed to thrive and became emaciated, was found to be due to LEPTOSPIRAL NEPHRITIS. P.M. examination revealed large quantities of fluid transudate in the pleural and peritoneal cavities with oedema of the perirenal fat and retroperitoneal tissues of the posterior and ventral abdominal wall.

It is suspected that the condition known in New Zealand as "SUMMER CATARRH" is an epizootic form of BOVINE MALIGNANT CATARRH.

"Q" DISEASE of chickens is causing deaths between 7 and 21 days of age. The aetiology is obscure.

GOITRE occurs in lambs born to healthy ewes fed on thousand-headed kale. This is said to be due to goitrogen in this kale. 78% of the lambs died.—J. A. GRIFFITHS.

NYASALAND. (1957). **Annual Report 1956, Department of Veterinary Services and Animal Industry, Nyasaland.**—[FAULKNER, D. E.]. pp. 46. Zomba, Nyasaland: Gov. Printer. **3460**

CONTAGIOUS ABORTION is said to be endemic among African cattle. The diease was diagnosed in the indigenous herd of Nyasa zebu cattle improvement centre in the Central Province, where 50% of the animals gave positive reactions, but only eight cows aborted. Calf vaccinations are being carried out.

Of 483 cattle tuberculin-tested in the Southern Province 1·23% were reactors. The Northern Province is considered to be a source of the infection.

EAST COAST FEVER (*Theileria parva* infection) is endemic in the Northern and Central Provinces. One case was diagnosed in the Southern Province. Infections of *Babesia* (REDWATER), *Rickettsia* (HEARTWATER) and *Anaplasma* (GALLSICKNESS), were treated in the Southern Province. Cerebral PIROPLASMOSIS was confirmed histologically in 11 cases. Prefabricated metal dipping tanks are being installed to extend dipping facilities to the endemic EAST COAST FEVER areas.

TRYPANOSOMIASIS is still a problem among cattle near tsetse-infested areas, but infections also continued to be transmitted by blood-sucking flies other than tsetse, particularly in the Lower Shiré River area. Dimidium bromide is used in treatment. Mortality from the disease is low.

DEMODECTIC MANGE of cattle "is still the cause of some concern in parts of the Southern Province." In one herd treatment is said to have been clinically successful, using benzyl benzoate locally and giving arsenic by injection. DEMODECTIC MANGE also occurred in dogs with SARCOPTIC MANGE. OTODECTIC MANGE was diagnosed among goat kids.

No cases of CUTANEOUS STREPTOTHRICOSIS were confirmed.

FOOT AND MOUTH DISEASE appeared in cattle in Tanganyika Territory near the Nyasaland border. There was no extension of the disease. There were 90 confirmed cases of RABIES in the Southern and Central Provinces. 1,872 dogs were immunized and 6,725 destroyed. The animals infected were 74 dogs, 9 cats, 5 cattle, 1 sheep and 1 fox. Mass immunization of dogs is proposed.

INFECTIOUS OPHTHALMIA in cattle was reported and HELMINTHIASIS in all young animals is as usual a cause of losses. Liver fluke in cattle and the tapeworm *Stilesia hepatica* in sheep and goats are causes of the condemnation of livers.

A large part of the report is taken up with the animal husbandry measures and the marketing of animals. Actually there is a great shortage of livestock to supply meat for the increasing population. Some cattle imports from Portuguese territory have been permitted.

—J. A. GRIFFITHS.

BELGIAN CONGO. (1958). Le fonctionnement du laboratoire Vétérinaire d'Elisabethville en 1956. **[Annual report for 1956 of the Veterinary Laboratory at Elisabethville.]** [DEOM, J.]—*Bull. agric. Congo belge* **49,** 183-193. [In French. Summary in Flemish.] **3461**

Research during the year included study of the effect of Newcastle disease vaccination on the rapid agglutination test for pullorum disease. Salmonella strains isolated from slaughter animals included 41 different types belonging to 12 serological groups. Of these, four are considered to be new and others had not been previously isolated in the Congo. Other activities were concered with the hygienic control of milk and milk products and the diagnosis of disease. Infections diagnosed were: mastitis 93; bovine brucellosis, 104; salmonellosis, 140; bovine TB., 1; rabies, 14 (dogs); Newcastle disease, 14. Details of vaccines and diagnostic agents produced are included.—T.E.G.R.

BOOK REVIEWS

FRANCIS, J. [Professor of Veterinary Preventive Medicine and Dean, Faculty of Veterinary Science, University of Queensland.] (1958). **Tuberculosis in animals and man. A study in comparative pathology.**—pp. xiii + 357. London: Cassell & Co. Ltd. 105s. **3462**

The first portion (pp. 112) dealing with tuberculosis in cattle and bovine-type infection in man is a revision of the author's "Bovine tuberculosis" 1947, expanded by the inclusion of the relevant literature of the past ten years and more detail of some of the earlier work. An account is given of the campaign against bovine tuberculosis in Great Britain up to 1957, the rapid progress of which makes the author reduce to roughly one half his previous estimate of the time required for practical eradication of the disease from cattle in this country. In the chapter on bovine-type infection in man the danger of man acquiring bovine-type infection by the respiratory route in the cowshed is emphasized.

Extensive information on natural, and where available experimental, tuberculosis in many species of animals including wild as well as laboratory, farm and domestic animals and birds, is brought together in the second section. This section is particularly useful and well composed. The account of the disease is dealt with under the headings: — incidence, susceptibility, pathology and allergy, and at the end of this section a concise summary is given for each species.

In the final section the author groups the animal species and man according to the pathology of the lesion, reactivity to tuberculin, susceptibility to infection and natural spread of the disease, and discusses the general relation between these. A more detailed account of human tuberculosis would have been of value and might be expected from the title of the book.

An appendix gives a list of contents of the Reports of the British Royal Commission on Tuberculosis. The general arrangement of the book, which is written in a clear and readable style, is excellent. It will be a reliable source of information and references for all working on tuberculosis and others interested in the disease in animals and man.—P. STUART.

NEMESÉRI, L. & HOLLÓ, F. (1957). Állatorvosi parazitológiai diagnosztika. **[Diagnosis of parasitic diseases of domestic animals.]**—pp. 247. Budapest: Mezőgazdasági Kiadó. Ft 32. [In Hungarian.] **3463**

This book is an attempt to approach the "jungle" of parasitological detail by making a survey of the diagnosis of the parasitic diseases, which method serves simultaneoulsy as a means of spontaneous selection of the pertinent details of practical importance in the life-histories of the parasites concerned. It will be helpful to practitioners as well as students as a comprehensive guide to the practical aspects of parasitology.

The three chapters in the general section of 80 pages deal with diagnostic methods. The detailed part (168 pages) deals with the diagnosis of parasitic diseases in horses, ruminants, pigs, fowls, rabbits and carnivora. Each chapter ends with a useful key to identification of eggs, oocysts or larvae which may occur in the faeces of the species concerned. There is an index, but no list of references.—A. SEBESTENY.

CAMERON, G. R. [Director, Graham Research Laboratories, Professor of Morbid Anatomy, U.C.H. Medical School, University of London.] (1956). **New pathways in cellular pathology.** pp. vii + 90. London: Edward Arnold Ltd. 16s. **3464**

Dissatisfied with the limitations of the morphological approach to pathology, Professor Cameron is pioneering a new approach to the study of morbid processes. Starting from electron microscopy and histo-chemistry and developing and applying new biochemical and biophysical techniques, he and his colleagues are exposing the minutiae of cellular structure and studying normal function and dysfunction at this level.

In the field of veterinary pathology there are still many problems capable of elucidation by morphological techniques, or, rather, morphological techniques will still be useful in sorting the problems to be solved. But an impasse has already been reached in their application to the study of some diseases. For example, copper analysis of soil, pasture and animal tissues, combined with the study of the morbid anatomy of the nervous system have defined the disease known as swayback and established prophylaxis, but the actual morbid processes underlying the disease are being studied by a colleague of the author, applying techniques discussed in this book.

In this book, which is an expansion of two public lectures, the author has set out to stimulate the reader and persuade him to follow him and his colleagues along new pathways. In this he will probably succeed.—L. M. MARKSON.

COWAN, S. T. & ROWATT, E. [Edited by.] (1958). **The strategy of chemotherapy. Eighth symposium of the Society for General Microbiology held at the Royal Institution, London, April 1958.** pp. ix+360. Cambridge: University Press. 35s. **3465**

The contributors to this symposium were presented with a formidable task when they were asked to suggest fresh ways of attacking micro-organisms by chemotherapy without damaging the host. A major part of the discussions inevitably was devoted to the general principles which govern the action of known compounds. This has resulted in a series of valuable reviews of the current problems of chemotherapy.

Studies on the mode of action of chemotherapeutic substances have produced valuable data on the physiology and biochemistry of the micro-organisms themselves but, as many of the contributors point out, there are still many gaps in our knowledge. There is a general feeling that effective strategy in chemotherapy will only be possible when much more is known about the nature of the micro-organisms and their relationships with their hosts. Nevertheless this symposium proved very stimulating and the problems which were discussed are likely to keep a generation of biochemists and microbiologists busy.

The sixteen contributions to the symposium include sections on "Inhibitors of energy-supplying reactions" (H. A. Krebs), "Metal-binding agents in chemotherapy: the activation of metals by chelation" (A. Albert), "The designing of antimetabolites" (D. W. Woolley), "Selective inhibition of virus multiplication" (I. Tamm), "Specific inhibitors of protein synthesis" (E. F. Gale), "The chemotherapy of bacterial infections" (R. Knox), "Chemotherapy of fungal diseases" (R. J. W. Byrde & G. C. Ainsworth), "The chemotherapy of some protozoal infections" (L. G. Goodwin).

—L. P. JOYNER.

BONADONNA, T. (1957). Nozioni di fisiopatologia della riproduzione e di fecondazione artificiale degli animali domestici. **[Physiopathology of reproduction and of artificial insemination in domestic animals.]** pp. 1659. Milan: Collana Tecnico–Scientifica "L. Spallanzani." L. 12.000 [2 Vols.] **3466**

This is a quite monumental work; the literature has been surveyed with scrupulous industry and accuracy and the result is a product of scholarship considerably superior to anything which has previously appeared in any language. It is a pity that only relatively few workers in this field will be sufficiently versed in Italian to make full use of the book. Such is the rate of progress in research to-day, that such a work is not completely up to date, even as text-books go, by the time it has appeared in print, while before an English or German translation can appear, a still greater proportion of highly significant subsequent work will have been published. Bonadonna fully realizes his difficulty and concludes the book with over 60 pages of "stop press" notes incorporating progress in each section up to November 1957. It seems a pity that the publishers could not see their way to provide a stiff cover, and the plan of publishing the list of references as a separate booklet is in several ways inconvenient.

The book comprises six main sections, of which the first relates to the development and present position regarding artificial insemination throughout the world, detailed continent by continent and state by state. The second part covers normal reproductive anatomy and physiology, including the fowl as well as the horse, ox and sheep, but leaving out the pig and considering the male side in greater detail than the female. The third section deals with semen collection and insemination in all farm animal species, dogs and rodents, and birds, while the fourth and fifth comprise semen technology including dilution, freezing, transport, staining and density determination. This part includes three chapters on abnormal and pathological semen.

The sixth part comprises general considerations on the promotion of maximal fertility and includes a good chapter on egg transplantation.

There are 14 appendices, including the report by F.A.O. on international legislation on the export of semen (Cambridge, 1952) and the

American Dairy Science Association rules on A.I. Many of the others are Italian Government publications in connexion with the practice.

Thus the book is essentially a text-book of A.I., with limited obesrvations on pathology, adduced in parenthesis where relevant. The illustrations are numerous, usually of good quality, and always to the point. The photomicrographs are better than the photographs of animals, and some are in colour.—F. L. M. DAWSON.

ANON. (1958). Bericht des 2. Kongresses der Deutshcen Veterinärmedizinischen Gesellschaft. Bad Nauheim 6./7. April 1957. **[Proceedings of the 2nd Congress of the German Veterinary Medical Association, Bad Nauheim, April 1957.] pp.** 107. Berlin (& Hamburg): Paul Parey. DM 18. **3467**

The theme of this congress was animal reproduction. The proceedings contains papers on the biomorphology (Tillman) and biochemistry (Brüggemann & Karg) of reproduction; post-ovulatory life of ova (Huhn); semen examination and testicular biopsy (Ullner); uterine biopsy (Brodauf); heredity (Aehnelt), nutrition (Lenkeif) and climate (Bauer) in relation to fertility; control of sex by artificial insemination (Baier); pathology of gametes, embryo and foetus (Cohrs); genital infections (Goerttler); pathology of the puerperal period (Benesch); listeria infection in cattle (Hartwigk); selective cultivation of *Vibrio fetus* (Dedié); bacterial flora of the vagina of cows (Täubrich); chemotherapy of genital infections (Gellert); diagnosis and therapy of human brucellosis (Strauch). There are also brief accounts of the epidemiology of rabies (Schindler) and veterinary uses of microwaves (Wild).

All these papers are largely discussions of previously published work and do not appear to contain any new work. Some papers are followed by a general discussion.—R.M.

GRAY, A. P. (1958). **Bird hybrids. A check-list with bibliography.** pp. x+390. Farnham Royal: Commonwealth Agricultural Bureaux. 50s. [Technical Communication No. 13 of the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.] **3468**

Bird Hybrids is a companion volume to the same author's *Mammalian Hybrids,* published in 1954. Whereas over 300 mammalian hybrids were listed, over 3,000 are listed in the present work and the bibliography contains well over 1,900 titles. The work will be an authoritative text for a generation or more. It is well produced and the printing and layout is clear and easy to follow.—R. N. FIENNES.

HILL, W. C. OSMAN [Prosector to the Zoological Society of London.] (1957). **Man as an animal.** pp. 176. London: Hutchinson & Co. Ltd. 10s. 6d. **3469**

The purpose of this book is to show man as a species of animal, relatively unspecialized and structurally not far removed from the primates. That he is a less advanced species than the carnivores and ungulates is apparent from his structural imperfections, such as the small size of the birth canal and the tendency to hernia and varicose veins. As a mammal, he has few outstanding features, and he is subject to the same kinds of diseases and hereditary and physiological mechanisms as other species. Examination of the human races shows how each has developed characteristics suiting it to a particular part of the world. An extreme example of human adaptation is provided by the Eskimos, who would die if removed from their environment. The book ends with a plea that surviving populations of primitive man should be preserved from cultural contact and miscegenation with more advanced races.

—M.G.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BRAY, R. S. (1957). **Studies on the exo-erythrocytic cycle in the genus *Plasmodium*.** pp. vii +192. London: H. K. Lewis & Co. Ltd., 42s. [London School of Hygiene and Tropical Medicine Memoir No. 12.]

PATTEN, B. M. (1958). **Foundations of embryology.** pp. xvi+578. New York (London and Toronto): McGraw Hill Book Company, Inc. 74s.

RAETTIG, H. (1958). Bakteriophagie 1917 bis 1956. Teil I. Einführung, Sachregister, Stichwortverzeichnis. Teil II. Autorenregister. **[Bacteriophage: 1917 to 1956. I. Introduction, subject index and alphabetical index. II. Author index.]** pp. xix+215 and 344. Stuttgart: Gustav Fischer. DM 44.

ROLLE, M. (1958). Mikrobiologie und Allgemeine Seuchenlehre. Lehrbuch für Tierärzte und Studierende der Tiermedizin. **[Text-book of microbiology and general epidemiology for veterinary surgeons and students.]** pp. xi+448. Stuttgart: Ferdinand Enke Verlag. 2nd revised Edit. DM 46.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.

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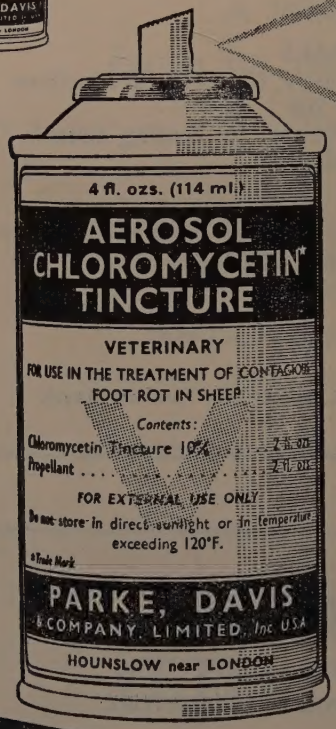

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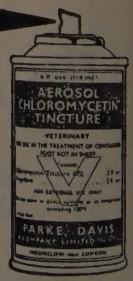

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